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DEC. 6

1954

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AF Sells $400 Million In Aircraft 27

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New Ramjet for Helicopters 52

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AIRTRENDS Washington, D. C., Dec. 6, 1954

WHEN CONGRESS MEETS, all three services can expect a rough time from the House and Senate Small Business committees. The small firms continue to complain about their share of the defense dollar, and the lawmakers are listening. To counter such claims, each service is preparing detailed figures showing amounts and percentages of military business handled by small firms.

Prime contractors are in the middle. They are being asked to give small business more subcontracts and to cut prices to the services as well.

CONFUSION IN GUIDED MISSILE purchasing and development programs may be on the way out. Things got so bad with Army, Air Force, and Navy's BuOrd and BuAer buying missiles, that the whole guided missile program is now being placed in the hands of Assistant Defense Secretary Donald A. Quarles.

FIRST ACTUAL SPENDING in machine tool stockpiling program will come soon when Defense Department will begin placing orders amounting to $100 million for special purpose tools. Breakdown among services will be: USAF—about $84 million; Navy—about $14 million; and Army—less than $2 million.

The $100 million is the total amount approved by Congress for fiscal 1955. Original program sought under Truman administration called for $500 million, but was later cut in Eisenhower fiscal '54 budget and approved by Congress at $250 million. When Pentagon sought renewal of authorization of this amount in fiscal 1955, House and Senate compromised on the $100 million figure after the House voted no funds for the program.

DESPITE RECOGNITION in some CAB circles that airlines should be permitted to accumulate earnings for re-equipment needs, there is little possibility of a board authorization for higher fares, or even joint airline talks about higher fares.

Recent presentation to the board by ATA president Earl D. Johnson on the economic status of the industry did not change the views of members lined up against higher fares. Some board people feel the airlines are now in better shape than they were six months ago when the first such Johnson presentation was made.

Unlike the first meeting, however, there was no request by Johnson last month for fare discussions or fare increases, and CAB isn't about to suggest that any such action be taken.

A PAY INCREASE "across the board" is in the works for USAF personnel, according to AF Secretary Harold E. Talbott, who noted that about 200,000 personnel who joined the USAF during the Korean war are now completing their four-year terms of service.

Suggesting that an increased pay program might persuade many of them to remain in service, he estimated that if all were to quit the AF would lose a $2,800,000,000 investment.

Bentley - 10/12/65

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AIRTRENDS *(Continued)*

Talbott pointed out that since 1939 an airman's pay has increased only 110% and an officer's pay only 59%, while the cost of living has gone up 200% and organized labor's pay has increased 300%.

U. S. DOMESTIC TRUNK AIRLINE revenues for 1954 will come close to the $1 billion mark, probably reaching $965 million, according to the estimate of Earl D. Johnson, president of the Air Transport Association. There are no conclusive indications that airline traffic growth is terminating, Johnson feels, but industry must concentrate on widening its profit margin.

In this direction, the ATA head recently slated these three topics for discussion with CAB: (1) Rising airline operating costs versus static fares; (2) Need for "forward-looking regulations" that would allow industry to stay financially sound; (3) Continuing need for large amounts of new capital.

INDIVIDUAL MEMBERS of the Air Coordinating Committee are now appraising a highly classified organization and procedures study of ACC prepared by the Bureau of the Budget in anticipation of a top-level meeting on the subject sometime this month.

Budget Bureau undertook the review of ACC three months ago for the express purpose of improving its usefulness to the Administration.

A "BREAK-THROUGH" IN LABOR DEMANDS is what the CIO-Autoworkers call the new contracts with Fairchild and Glenn L. Martin.

What they broke through, claims UAW v.p. John Livingston, was industry determination to hold wage increases down to a nickel.

Union shop is also an issue. The full union shop obtained at Fairchild is first to be won at a major airframe plant in three years, one of three in the country, says the union publication, "United Automobile Worker."

AN OFFENSIVE AGAINST EXCISE TAXES on transportation is being mounted by the Transportation Association of America. Opening gun for this session of Congress, aimed at repeal of the taxes, will be a 12-page booklet, spelling out the arguments against them.

Four good reasons why they should go, says TAA: (1) They add to the cost of living; (2) They result in discrimination; (3) They pose undue burdens; (4) They aggravate the problem of mass transportation, already serious enough.

The taxes amount to 10% on transportation of people, 3% on property.

GIVING SAFETY INSPECTION BACK TO THE INDUSTRY and taking it out of the hands of the government, at least on the grass-roots level, should soon make more real progress.

Aviation's impressive safety record is behind CAA support for the idea.

Establishment of standards of quality control and ethics by the industry will see the CAA further bowing out of detailed investigative work.

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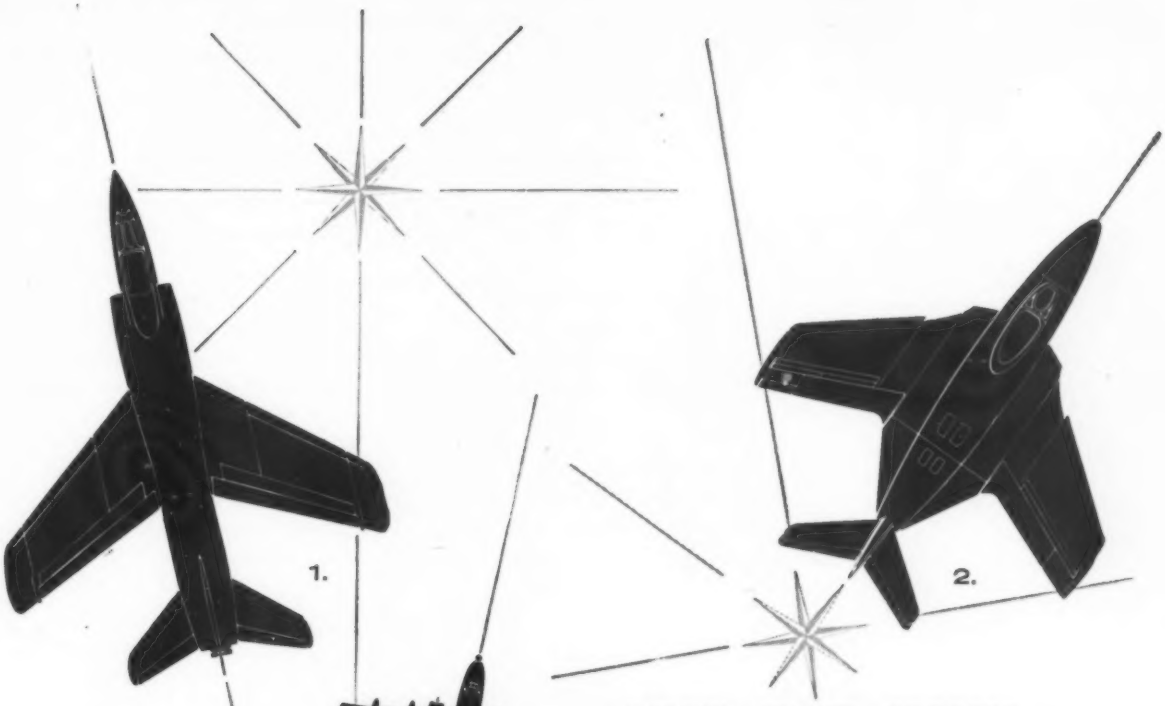

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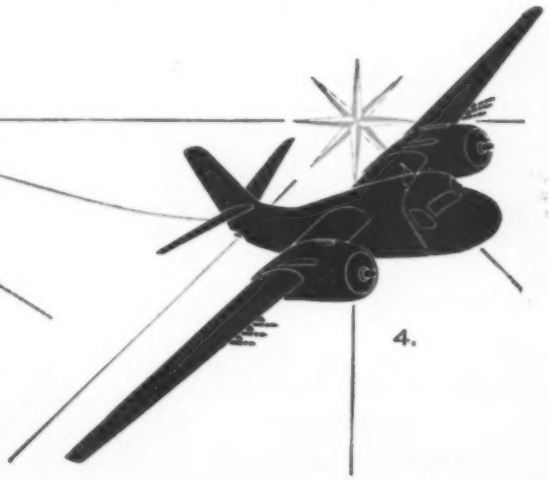

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• **Although most of Hannibal Ford's** early work was for the Navy, his company is now working for all branches of the armed forces, building intricate and unbelievably accurate devices for guided missiles, supersonic planes, and army ordnance. Masters of the new sciences of automatic controls and computing mechanisms, the hundreds of engineers and thousands of technicians at Ford Instrument Company are creating millions of dollars of electronic, hydraulic, electrical, mechanical and magnetic instruments each year. And their skills are being utilized by the Atomic Energy Commission and private industry as well.

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Letters

Letters should be addressed to The Editor, AMERICAN AVIATION *Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C. Anonymous letters will not be printed, but names will be withheld upon request.*

Foreign Aid In Reverse

To the Editor:

While not wishing to enter into the controversies arising out of Bernard S. Van Rensselaer's report to the Senate Appropriations Committee, that report recalls some parallels in history that ought to be quoted for the record. It is probably better to say what has to be said now that the first storm of indignation and counter-blast has died.

If it is a question of the U. S. subsidising the U. K. aircraft industry to the point of making it a dangerous commercial competitor, it will simply be history repeating itself in reverse.

Fifteen years back it was British rearmament against Nazi aggression that gave the U. S. airplane industry its first really big orders. British contracts for airplanes, engines, and accessories totaled over $1.5 billion by April 1941. These orders were about four times U. S. military contracts in this period.

It was the RAF orders for 1100 AT-6 (Harvard) trainers, followed by the British specification and orders (310) for the Mustang fighter that put **North American** on the map. It was the RAF buying 834 Hudsons for coastal patrol (followed by 250 P-38s and 300 Venturas) which first gave **Lockheed** large-scale production orders. Other production lines founded on British orders were: **Douglas** Boston (A-20) 300; **Martin** Maryland (187) 334; **Curtiss** P-40 series, 546; **Consolidated** PBY Catalina, 50; **Brewster** Buffalo, 120. These figures are from U. K. records of airplanes delivered and paid for prior to lease-lend.

Other official figures are also illuminating: total U. K. contracts to the summer of 1941 were for 11,359 airplanes —inclusion of those for the Commonwealth air force brought this up to a grand total of 12,197. Breakdown of cash payments up to April 13, 1941, was airframes $850 million, engines $600 million, and accessories $100 million.

For the record, also, may be quoted the breakdown of U. K. airplane contracts signed by the summer of 1941. These were heavy bombers 185, medium bombers 695, light bombers 4468, fighters 4009, flying boats 109, naval airplanes 181, transports 9, trainers 1694.

Just to make this a historically true story, some of the aforementioned airplanes (A-20's, P-36's and Martin 187's) were ordered by France, but taken over and paid for by Great Britain.

It is fair enough, then, to say that the U. K. laid the foundation stone of the U. S. aircraft industry's expansion from pre-war size. Later, in the Churchill-Roosevelt agreement of the Atlantic Pact, airplane production effort was divided and Britain concentrated upon bombers and fighters, leaving transports exclusively to the U. S. It was this that gave the world's airlines their thou-

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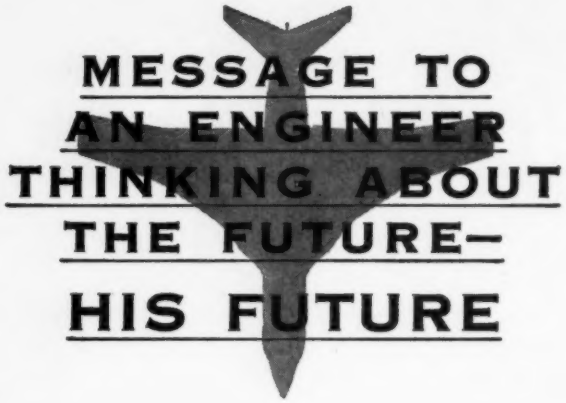

MESSAGE TO AN ENGINEER THINKING ABOUT THE FUTURE— HIS FUTURE

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These facts are offered for their own worth, neither as terms of abuse nor to argue the relative merits of one ally with the other. And to them one more must be added for completeness:

British rearmament orders—remember four times USAF and USN orders at the time—enabled the U. S. aircraft industry to start expanding, ready for its stupendous production effort in World War II. U. S. economic aid was established for an exactly parallel purpose—to insure that the British and European aircraft industries would be in a fit state to take their share of the burden in defending the free world.

What is sauce for the goose is sauce for the gander—if the U. S. has helped the Viscount, the U. K. also helped the Constellation.

CASTLE WOOD
London, England

Nantucket Fly-In

To the Editor:

We appreciate very much the very fine write-up in the October 11 issue of AMERICAN AVIATION regarding the Nantucket fly-in.

It was the smallest flight we have had in a great number of years and you were more than generous in your comments.

J. B. HARTRANFT, JR.
President
Aircraft Owners and Pilots Association
Washington, D. C.

Art or Hypocrisy?

To the Editor:

I found your article, *Death in the Afternoon*, (AMERICAN AVIATION, Oct. 11) to be biased and incorrect. I have long been a faithful subscriber to AMERICAN AVIATION — ever since serving with American Airlines in Chicago as assistant to the district sales manager. Currently, I am in Mexico actively participating as a matador de novillos in the profession you so scornfully wrote about. Therefore, I understand "la fiesta brava" more than most Anglo-Saxons understand football.

First of all, *los toros* is definitely not regarded as a sport, but as an art based on centuries of ritual and custom—an art that enables a 150-pound *(or less)* man to pit his life against the bull's, and only through skill, valor, and art, dominate and kill the 1500-pound toro. This animal has been bred to kill for over four centuries, can easily outrun a race horse in the first hundred feet, and can turn faster than a polo pony. He's an intelligent and magnificent animal that has not been molested by man until he enters the ring. Until that time he has been literally "living off the fat of the land."

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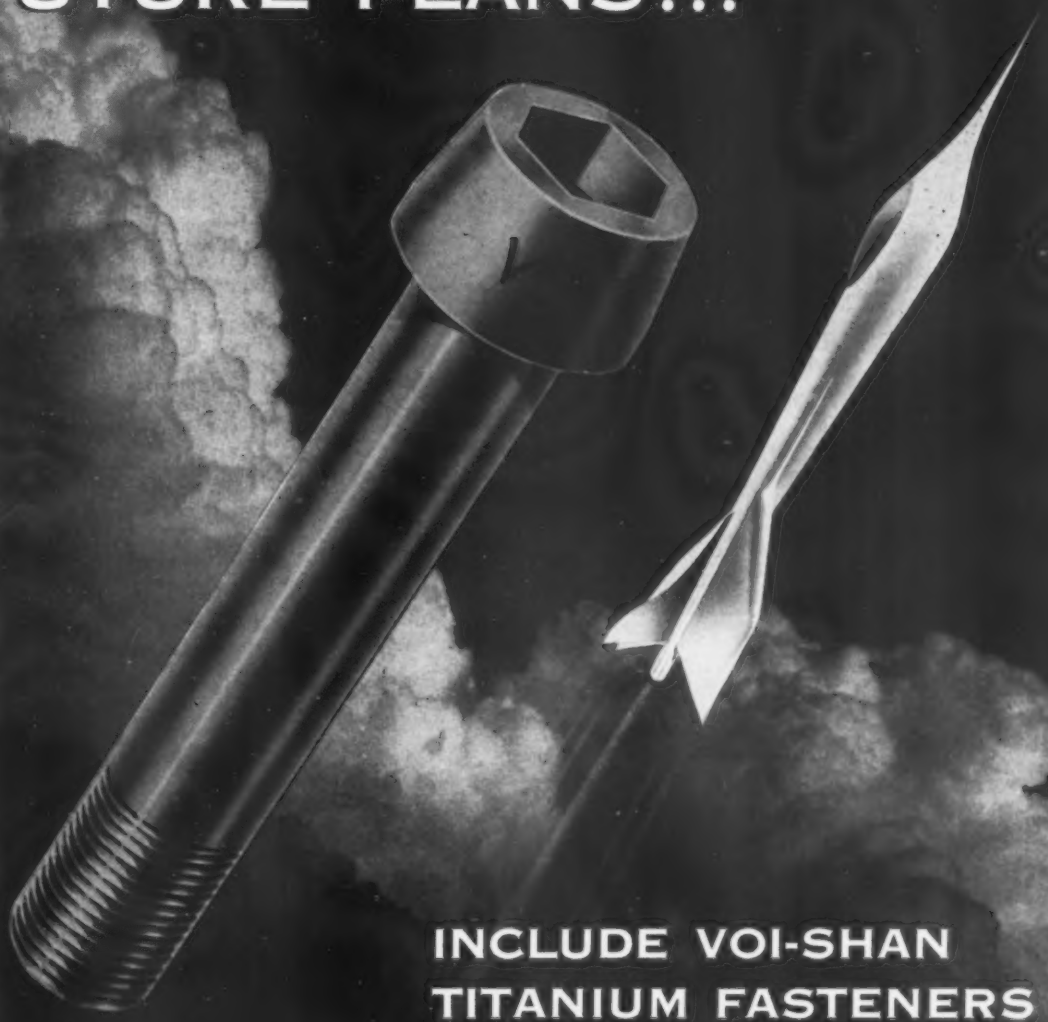

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first sword thrust the matador must kill the animal within a time limit, usually five minutes. The animal does not feel the "darts" as you call them. And I doubt very much if he is aware of the sword thrust.

Rarely do the horses get gored. I've seen it happen only once, and again you had the misfortune of seeing it. And so one of the fellows ran when his cape became snagged on the bull's horns—what would you do, Mr. Parrish, providing, of course, that you had the nerve to enter the ring in the first place and face a 1500-pound bull that is bent upon killing you? I have not known men until I came to Mexico and met my torero colleagues.

Here is a good example. A friend of mine, "Chucho" Salcedo, was fighting in Juarez on June 13th. As he went in for the kill, the bull suddenly jerked up its head. One of the horns caught and totally removed the boy's left eye.

On July 13th, just one month later, his artificial eye was placed, and on August 8th, "Chucho" was again facing the bulls. Brave? Yes, the bull is always killed, as compared with 10% fatalities for the matadors. But what kind of death does this brave animal favor? The meaningless slaughter of a packing house or death in the ring, where he is sure of victory up until the very last minute?

LUIS ROSS GUGEL
Milan, Mexico

To the Editor:

Death in the Afternoon is well told, and how true it all is. I'm wondering if your blood was boiling at the time you wrote it, as the blood of many a reader has boiled reading it.

It seems strange that in this day and age the leftovers of a pagan period should still exist in a country that calls itself Christian and takes time out to celebrate Holy Week. Down on their knees one week and then back at the devilish sport of sadistic torture and slow death the next. What sheer, damnable, utter hypocrisy!

The matadors, picadors, and the rest aren't forced into the ring, but the brave bulls and horses are, and it's a one way trip for them. Maybe you didn't witness the "Banderillo del Fuego" (fire darts) that explode and scorch the bull's hide. Also the little matter of horses vocal cords being cut before the fight, so they don't cry out when their bellies are ripped open. Some horses that have been disemboweled have been taken out of the arena as often as three times, sewn up, and brought back.

Right after the war, the nation went in for the civilized sport of "soccer-football" in a big way, and many foreigners hoped that the country had reformed and cast out pagan traditions. But it wasn't for long—back came the bulls, the horses, and the Sunday afternoons of anguish and agony.

I wonder how many of the dollars we are shipping over there today, will find their way into the bull and horse breeding farms, so that the ancient tradition and noble art of bullfighting, may not perish from the earth.

WILLIAM E. SILVERTHORNE, JR.
New York, N. Y.

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New York-Manila via The Great Circle

temp. variation:
150 degrees F.

spark plugs:
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The RC 26S and R 37S-1 are most widely used of Champion's many types of aircraft spark plugs.

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Operating halfway around the globe, Northwest's Boeing Stratocruisers and DC-6B tourist aircraft encounter the widest range of weather conditions, with temperatures sometimes varying as much as 150 degrees F.

To meet these conditions successfully and provide dependable service, Northwest—millions of miles ago—selected Champion Spark Plugs as the most economical and reliable for its entire fleet.

Airline purchases are made only after the most rigid, scientific testing. Every major American airline and most foreign carriers fly Champion Spark Plugs. That's a good fact to remember next time *you're* in the market.

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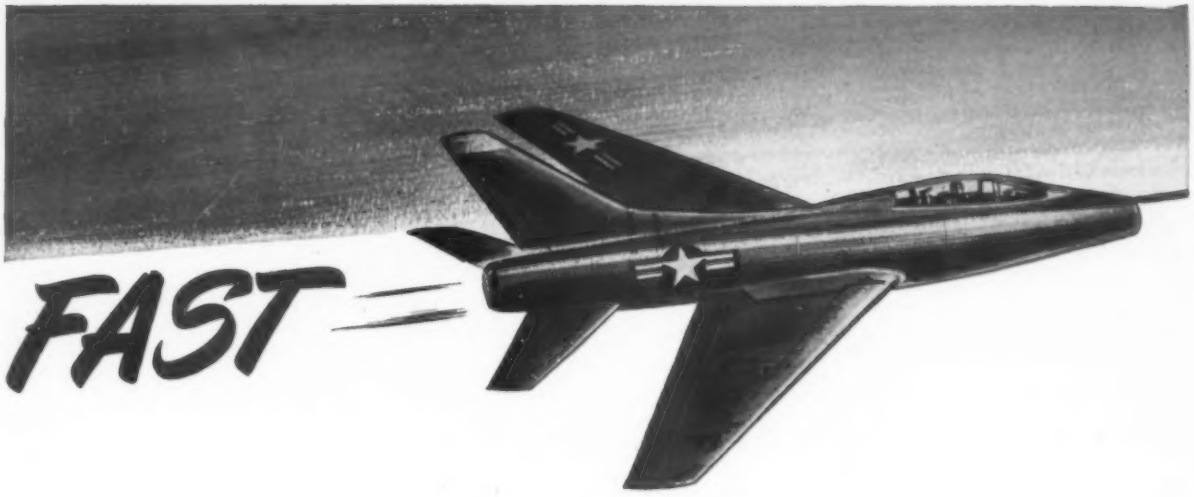
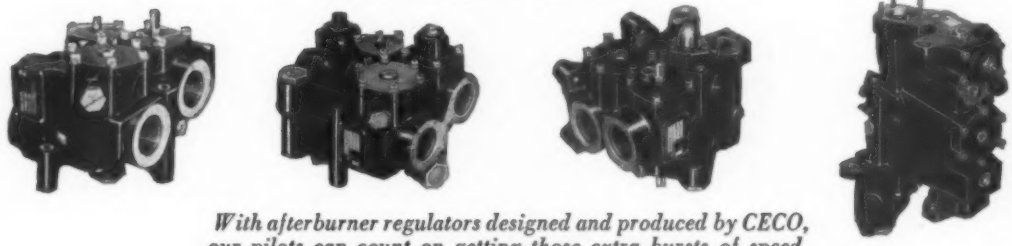


When the need arises, our jets must get up and at 'em fast . . . airborne and on the way to intercept within seconds of the first radar alert. The added power to thrust several tons of fighting craft into the air in a hurry — to supply "throttle-burst acceleration" for delivering the knock-out punch — comes from the engine's afterburner.



With afterburner regulators designed and produced by CECO, our pilots can count on getting those extra bursts of speed . . . power in a pinch . . . when needed most. And from the CECO engineering-production team you can count on jet-engine components designed and built to meet your most exacting requirements.

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Carl Vrooman, icing tunnel group head, studies hot-air cyclic de-icing test on wing section of C-130 transport. The tunnel has a temperature range of −40° F. to +150° F. and maximum air speed of more than 270 mph.

New icing tunnel speeds thermodynamics research at Lockheed

Designed to meet a constantly increasing volume of thermodynamics work, Lockheed's new icing research tunnel now provides year 'round testing in meteorological environments normally found only in flight. It is the first icing research tunnel in private industry.

Lockheed thermodynamics scientists are now able to study in greater detail problems such as: thermal anti-icing; cyclic de-icing; various methods of ice removal; distribution of ice; rate of temperature changes in aircraft components; thermodynamic correlation between laboratory and flight testing; and development and calibration of special instrumentation.

C. H. Fish, design engineer assigned to the tunnel, measures impingement limits of ice on C-130 wing section. The tunnel has refrigeration capacity of 100 tons, provides icing conditions of 0 to 4 grams per cubic meter, droplet sizes from 5 to 1000 microns.

Thermodynamics Career Opportunities

Increasing development work on nuclear energy, turbo-prop and jet transports, radar search planes and supersonic aircraft has created a number of positions for Thermo-dynamics Engineers and Thermodynamicists.

Lockheed offers you increased salary rates now in effect; generous travel and moving allowances; an opportunity to enjoy Southern California life; and an extremely wide range of employee benefits which add approximately 14% to each engineer's salary in the form of insurance, retirement pension, sick leave with pay, etc.

You are invited to write E. W. Des Lauriers, Dept. AM-T-12, for a brochure describing life and work at Lockheed and an application blank.

B. L. Messinger, department head, analyzes test results with Thermodynamics Engineer E. F. Versaw (right) and Thermodynamicist Tom Sedgwick (left).

LOCKHEED
AIRCRAFT CORPORATION
BURBANK
CALIFORNIA

Books

Paratrooper *by Lt. Col. F. X. Bradley and Lt. Col. H. G. Wood. Military Service Publishing Co., Harrisburg, Pa.*

An impressive picture story of how paratroopers get that way. Physical training, practice jumps from towers, actual jumps from airplanes, and combat jumps with the trooper loaded down with what looks like the contents of a small warehouse—are all covered. The text is brief, the picture captions are informative, and only the obvious retouching on some of the photos mars the general effect.

. . . WK

The Gyroscope Applied *by K. I. T. Richardson, M.A. Hutchinson's Scientific and Technical Publications. Price $4.20. 384 pp.*

The author of this work has long been with the British Sperry company, but his comprehensive treatise is not biased on that account. The book deals, in clear language and a minimum of mathematics, with the fundamentals of the gyro for marine, aeronautical, weapon sighting, and missile applications. Amply illustrated. An excellent reference book for all who, without being specialists, need to know the possibilities and limitations of the gyro.

. . . JHS

When & Where

Dec. 15—Air Transport Association board of directors meeting, Statler Hotel, Washington, D. C.

Dec. 16—Air Transport Association membership committee meeting, Statler Hotel, Washington, D. C.

Dec. 17—Eighteenth Wright Bros. Lecture, U. S. Chamber of Commerce Building Auditorium, Washington, D. C.

Dec. 20—Eighteenth Wright Brothers Lecture, Los Angeles.

Dec. 22—Eighteenth Wright Brothers Lecture, Cleveland.

Jan. 24-28—Twenty-third annual mtg. of the Institute of the Aeronautical Sciences, Hotel Sheraton-Astor, New York City (including Honors Night Dinner).

Mar. 11—Institute of the Aeronautical Sciences national flight propulsion mtg., (restricted), Hotel Carter, Cleveland.

Mar. 28-Apr. 1—Ninth Western Metal Exposition, Pan-Pacific Auditorium, Los Angeles.

Apr. 5—International Air Transport Association technical conference, San Juan, P. R.

Apr. 29—Institute of Navigation's eastern regional mtg., Friendship International Airport, Baltimore.

May 2-5—Society of Aeronautical Weight Engineers annual national conference, Hilton Hotel, Fort Worth.

June 21-24—Joint mtg. of the Institute of The Aeronautical Sciences and the Royal Aeronautical Society of Great Britain, IAS Building, Los Angeles.

June 23-25—Institute of Navigation annual mtg., Air University, Maxwell AFB, Ala.

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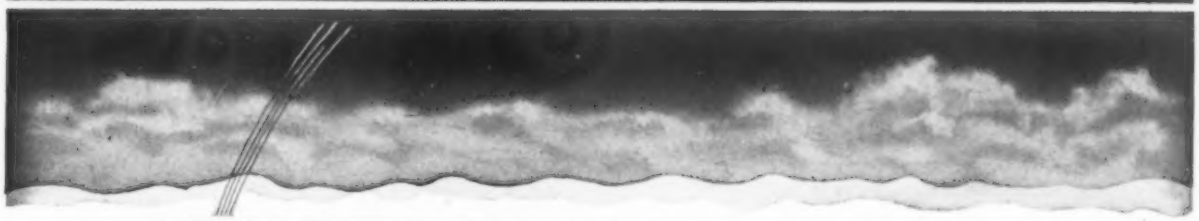
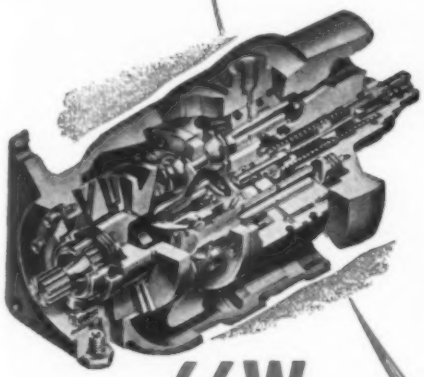


STRATOPOWER Is Ready for the Planes Which Will Break Through Today's Ceilings

The modern STRATOPOWER Hydraulic Pumps are ready and able to perform efficiently well beyond heights penetrated by piloted aircraft. They've proved it! In Rockets, Guided Missiles and under the simulated conditions of the ionosphere STRATOPOWER Pumps *pump!* They are built to perform at full efficiency and with complete dependability under the extreme conditions and variables imposed by projected speeds and service ceilings.

STRATOPOWER Pumps draw fluid from unpressurized reservoirs to sustain system pressure at altitudes where other pumps, dependent upon pressurized reservoirs, would be unable to supply system demands. Thus, they afford that vital added safety factor for high altitude operation . . . system actuation is assured, even though reservoir pressure may be lost.



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There is a STRATOPOWER Hydraulic Pump to provide the efficient source of fluid power for your requirement. Write for full information today.

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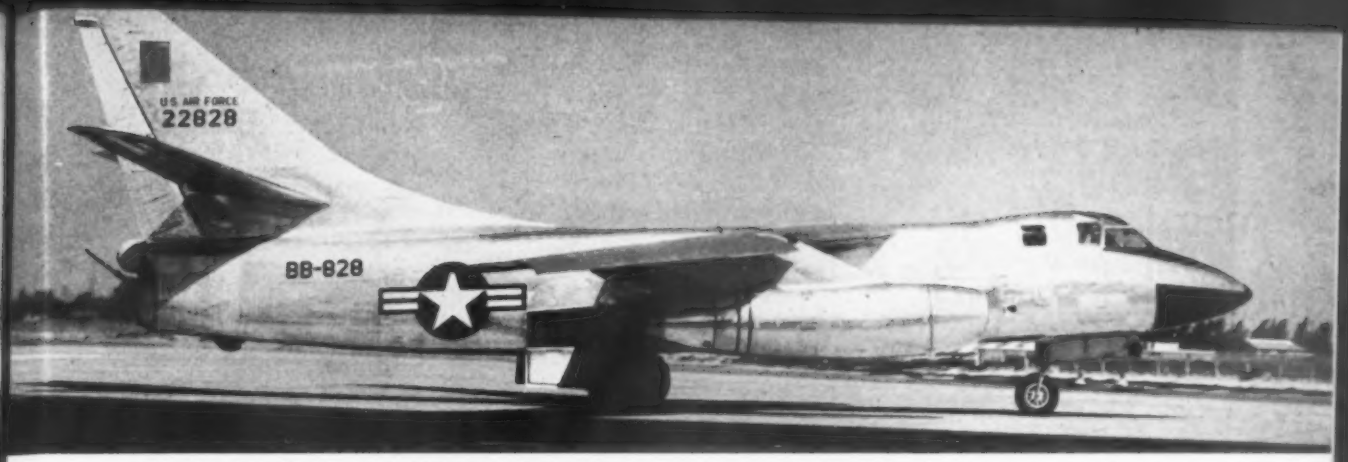
Douglas B-66 takes off at Long Beach, California, for its test run. Its electrical system was designed by G-E application engineers to deliver rated load with 80° C cooling air.

GENERAL ELECTRIC



Side view of bomber shows sleek lines. It is first production aircraft to have an elevated ambient temperature a-c electric system.

Latest Air Force bomber has new G-E engineered power-generating electric system

NEW GENERAL ELECTRIC ENGINEERED SYSTEM MEETS DOUGLAS B-66 OPERATIONAL DEMANDS FOR HIGHER AMBIENT TEMPERATURES

A new a-c electric power-generating system has been developed by General Electric, and is now operating on the Air Force's newest light bomber, the Douglas B-66. The system consists of three major components: high-efficiency alternators, static voltage regulators, and generator control and protective panels.

DESIGNED FOR HIGH PERFORMANCE AIRCRAFT

With a generator that can operate at high ram-air temperatures of high speed flight, the new G-E system is designed for long life and reduced maintenance time. Its static voltage regulator has no moving components to wear out, and under laboratory testing it has withstood 5000 hours of operation without maintenance.

Regulation is preset, and requires no pilot adjustment of voltage or load division. The control panel supplies the automatic control of start-up, shut down, and maximum protection against ground fault, over and under excitation, and open phase.

SPEEDS TAKE-OFF, SPARES PILOT

The new equipment begins operating as soon as the pilot starts the engine. The system contains only two toggle switches, which may remain "on" at all times, even when a fault develops. This eliminates a series of pilot functions and sharply reduces the time required to become airborne. Under normal conditions, fault clearing and resetting are fully automatic.

SINGLE SOURCE FOR COMPLETE SYSTEMS

General Electric offers a single source for complete a-c or d-c power generating systems and constant speed drives for most aircraft. For more information, contact your nearest G-E aviation specialist, or write Section 210-92, General Electric Company, Schenectady 5, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Static regulator (left) maintains constant alternator output voltage. Control and protective panel (right) helps locate and isolate faulty generation.

New G-E high-efficiency a-c generator has no harmonic over 1%; produces full rating when exposed to high temperatures in high speed aircraft.

Tests of system showed better protection against over voltage, over and under excitation, ground fault, anti-cycling, difference current, and open phase.

plant with a one-track mind...

Actually Twin Coach Aircraft Division is five plants—each devoted *exclusively* to aircraft production. We do no other work; we build no other products.

Here's why this is important. It means your airframe assemblies are built by experienced aircraft specialists . . . men who know no other standards than those of the aircraft industry.

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A-9123

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GRUMMAN S2F AND UF, BOEING B-52, PIASECKI HUP, REPUBLIC F-84F, AND CLASSIFIED EXPERIMENTAL AIRCRAFT TYPES

Industry Spotlight

• First prototype Cessna T-37 twin-jet trainer has now accumulated over eight hours and has been accepted by USAF. Second and third prototypes will be delivered in November and December and tooling is now frozen for production of an additional 11 evaluation aircraft. Gross weight of the T-37 is 5600 pounds, empty weight 3400 pounds, landing speed 67 knots.

• Airline installation of Lockheed speed kit in Model 1049 Super Constellations is being delayed by difficulties experienced in service with the new propeller afterbody. Other changes in the program include longer cowl flap segments, removal of wing walk paint and modification of refrigeration system scoop and exhaust openings.

• Apparent confirmation that Convair's B-36 was used in dropping one of the hydrogen bombs comes from a USAF contract award to the company in the sum of $1.3 million for "modification, modernization and decontamination" of B-36's. Need for decontamination stresses problems of radiation and heat to which such carriers are exposed.

• Douglas Aircraft Co.'s 50-passenger "DC-3 replacement" helicopter is still very much in the project stage. It probably won't be firmed up until several seemingly suitable powerplants have proved themselves.

• One reason Rolls-Royce Soar engine has such a remarkable power/weight ratio (nearly seven pounds thrust to one pound weight) is that it is not built to last. Its life is 10 hours.

• Convair, which has recovered most of the parts of the YF2Y-1 Sea Dart that exploded in mid-air over San Diego Bay Nov. 4, will "spare no effort to continue development" of the water-based fighter. The ship which was lost was the second unit. The prototype is currently being used for ski development work.

• New record for high altitude bailouts is 45,200 feet established in jumps from a Boeing B-47 by Captain Edward G. Sperry and 1st Lt. Henry P. Nielsen of Wright Air Development Center. Old record was 42,000 feet established in 1950.

• Ford Aircraft Engine Div. at Chicago delivered its first production P&W J57-7 turbojet engine with afterburner to North American for use in the F-100. Company's contract for J57 production runs until 1957. Ford's first J57 without afterburner was delivered last April.

• Statement of de Havilland Aircraft's Maj. Frank Halford that the world's first atomic-powered aircraft may be a flying boat and Britain may be the nation to build it highlights interest of various companies in the advantages of water basing nuclear-powered planes. Nature of companies in this country working on principal AEC/USAF contracts of this type doesn't bear out the likelihood of the first U. S. atomic plane being water-based.

• Goodyear's GA-400 one-man helicopter, recently demonstrated to Navy officials, is powered by a 25-horsepower Johnson outboard engine and has a gross weight of just over 400 pounds. The company-financed GA-400, which is not the one Goodyear entered in BuAer's current one-man helicopter competition, was completed six months ago.

• AF has now acknowledged three versions of the Super Sabre and an interceptor prototype of the F-100 has also been ordered. F-100A air superiority fighter is in production at Los Angeles and has also been ordered from NAA-Columbus. The Ohio plant will also produce two fighter-bomber versions, the F-100C and F-100D.

• Kaiser Aluminum & Chemical Corp. may be deleted from the USAF's heavy press program. Two forging presses, with capacities of 25,000 and 35,000 tons, which were eliminated last year in the reduction from 17 to 10 had been slated for Kaiser's Newark, O., plant. Now, AF Secretary Talbott is considering placing the two 8000-ton extrusion presses at Kaiser's Halethorpe, Md., facility under another operator, possibly Harvey Aluminum.

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Ask your ARC dealer to quote you on ARC's airborne equipment of proven dependability.

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Convair builds the world's most advanced aircraft through...

Engineering to the Nth power

NAVY'S XFY-1 TAKES OFF AND LANDS ON A DIME

Here's a new kind of aircraft for America's aviation arsenal...the Convair XFY-1, a vertical takeoff, delta wing Navy fighter. Powered by a turbojet engine, it is one of the world's fastest propeller driven planes.

The XFY-1 is as responsive as a hummingbird over a rose bud. It rises nose-up like a guided missile ...flies like a fighter at speeds beyond 500 mph...hovers motionless...darts forward, and sideways...backs down on its tail to a feather-light landing.

This remarkable aeronautical achievement is another result of Convair's engineering for the *maximum* degree of performance... the Nth degree of air power...

Engineering to the Nth power

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ANY SHIP BECOMES AN AUXILIARY AIRCRAFT CARRIER WITH THE XFY-1 ON DECK!

ANY FIELD, EVEN A BACKYARD, IS AN AIRBASE FOR THE XFY-1!

ANY PLACE WHERE FIGHTER-BOMBERS ARE NEEDED, THE XFY-1 CAN OPERATE!

Personal View

By WAYNE W. PARRISH

Norlin's Dream

THE POLAR ROUTE of Scandinavian Airlines System inaugurated late last month between Los Angeles and Copenhagen is not something that "just happened."

Behind the epoch-making trail blazing of a new trade route which takes full advantages of the flexibility of the airplane, was a dream of a Swede named Per A. Norlin.

Not only did Norlin envision years ago the eventual development of the polar regions for commercial air routes, but he saw the benefits to Scandinavia if the three countries of Norway, Sweden, and Denmark could join forces and operate a single airline as an example to the world of peaceful commercial collaboration by separate countries.

Per Norlin began laying the groundwork for SAS and for freedom of traffic rights before World War II. During the latter part of the war he visited the U. S. and fought alongside the U. S. for freedom of the air. Gradually his inter-country system took shape and in 1950 it became a formal reality as a partnership of free enterprise capital and stock participation by three governments. Norlin became a world figure in aviation with a host of friends in the U. S., while SAS became one of the great airlines on the globe.

Few airline inaugurals, if any, have ever matched the SAS festivities in Los Angeles and in Scandinavia several weeks ago. It was a sterling promotion from first to last.

But to those who knew the background of the formation of SAS and of the planning for the polar route, one item in the festivities was shockingly absent. Neither at the plush luncheon sponsored by the Los Angeles Chamber of Commerce, nor at the super-plush dinner given for over 700 leading citizens by SAS, was a single word said about Per A. Norlin, whose vision and planning and years of hard work made it all possible.

As an example of extreme bad manners by the Scandinavian politicos and others who were basking in the limelight and the newspaper photographs and headlines, the apparently deliberate omission of credit to Per Norlin will go down in aviation history as an inexcusable black chapter.

Per A. Norlin, one of the true "greats" in the aviation world, has resigned as SAS president December 31 because of "impossible working conditions." In plain language this simply means that the SAS board has neither fully lived up to its responsibilities to give top management businesslike support, nor has it fully appreciated the reasons why SAS has attained such high prestige in the U. S. and the world. Per Norlin has symbolized not only SAS, but the best in Scandinavia. Omission of even a solitary word of credit to Norlin at the Los Angeles celebrations reveals a startling void in the SAS board as to what SAS is all about.

Norlin will serve on the executive committee of the SAS board after January 1. His counsel will be vitally needed. SAS has become too important and too strong to fall by the wayside, but the measure of its greater success will be determined by the extent to which Scandinavian politicians and other of its board members measure up to the very high standards arising from the dreams and achievements of a certain Swede by the name of Per A. Norlin.

More AF Maintenance

WELCOME NEWS greeted the local operators meeting in annual convention in Miami Beach a few weeks ago. The NATA members were advised by the Air Force and the Army that more field maintenance work would be awarded locally. Operators were advised not to expand their existing facilities—a wise caution—but those with usable facilities will be getting a fair share of contracts.

This is a long-awaited and heartening development designed to give an economic shot in the arm to the fixed-base field. Both services are to be commended for implementing the stated policy of the government that civil aviation is the backbone of the national air defense.

Important Times Ahead

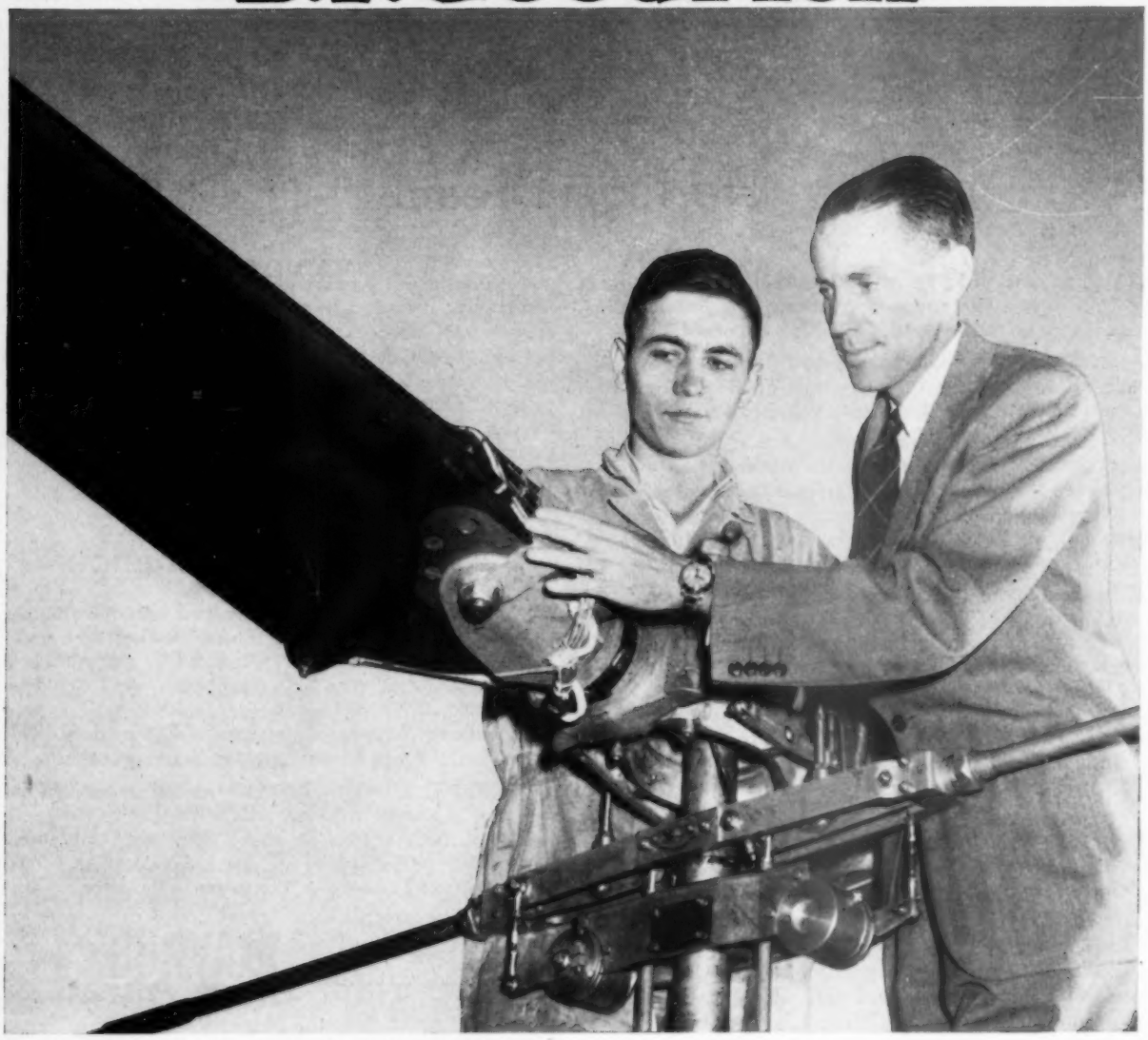
THE NEXT FEW MONTHS will be all-important to the air transport industry as various high-level government reports on general transportation policy will be made public.

Little attention has been given so far to the President's special cabinet committee assigned to study transportation problems and make recommendations for legislative or administrative action. But this is a potent committee and its recommendations may carry much weight.

Then there is the Hoover Commission which has various committees making detailed studies of transportation, including all military movements. These reports should be available this month or next and some of them will doubtless find their way into legislative proposals.

Air transport will have to watch closely. The railroad propaganda barrage against the airlines is being stepped up. There will undoubtedly be another movement toward a cabinet department for transportation, a development which would be most unfortunate for the air transport industry. The destiny of all transportation may well be shaped by the studies now nearing completion.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Checking B. F. Goodrich heated rubber installation, Bell Model 47

Egg beater whips ice

HELICOPTERS used to be grounded in cold weather. Ice forming on their rotor blades added dangerous weight, kept the "egg beaters" from taking off on life-saving missions.

Electrically heated rubber – rubber with resistance wires in it like a heating pad—would get rid of the ice. But wouldn't it create the same problem the ice did? Wouldn't it pile too much weight on the rotor, too?

B. F. Goodrich, working with Bell and the Navy, went after the answers. They designed a set of specially shaped heated rubber boots to minimize weight and bulk. They fitted the boots snugly along practically the entire length of the rotor. The anti-icing system was put through more than 50 tests on Mt. Washington in temperatures from 29° to -14° F. In freezing rain. In snowstorms. For 30 days.

Test results proved the new heated rubber would fill the bill. Rotors were kept free of ice. "Egg beaters" could now fly in weather and regions they never could before. The biggest single obstacle to all-weather helicopter operations had been removed.

Product of B. F. Goodrich engineering and research, heated rubber has solved many an aircraft icing problem. Other B. F. Goodrich products for aviation include tires, wheels and brakes; Pneumatic De-Icers; Avtrim; inflatable seals; fuel and oil cells; Rivnuts; hose and other accessories. *The B. F. Goodrich Co., Aeronautical Sales, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

Circle No. 71 on Reader Service Card.

ESTABLISHED JUNE 1, 1937

World's Largest Aviation Publishers
American Aviation

VOL. 18, NO. 14

To friendly foreign nations . . .

AF HAS SOLD $400 MILLION IN AIRCRAFT

BY HARRY S. BAER, JR.

THE U. S. AIR FORCE is in the midst of an expanding reimbursable military assistance program—one in which Latin American countries are showing increasing demand for modern U. S. jet aircraft.

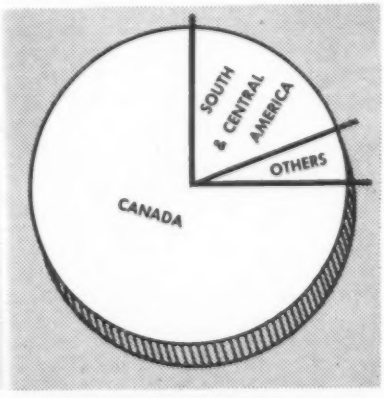
An office in the Pentagon, known as the AF Reimbursable Military Assistance Branch, is busy providing aircraft, equipment, materiel, and services (including training) to eligible friendly foreign governments.

It has already negotiated some $400 million worth of business, with the greatest proportion of these transactions conducted only this year.

The significance of this program to this country's aircraft industry is highlighted by the increasing number of requests for this type aid:

- Dominican Republic has made a formal request for 25 North American F-86F's.
- Venezuela is seeking 22 F-86F's.
- Argentina is expressing interest in 25 Lockheed T-33's.
- Guatemala is interested in U. S. jet aircraft in general *(no specific types)*.

The Venezuelan request is particularly noteworthy. This country in the past has purchased its jet air power, including numerous Canberra light jet bombers, from Great Britain, which up to now has been the primary source of jet aircraft for South American nations.



Where the $400 million came from.

To accommodate the anticipated jet demand from Latin America, the AF Reimbursable Military Assistance Branch has asked HQ, USAF to have available 190 F-86F's and 150 T-33's for sale from now through fiscal year 1956, which ends June 30, 1956.

Prior to the present flurry of jet aircraft activity down south, the AF sold many reciprocating types, such as Republic F-47's, North American F-51's, T-6's, and B-25's, Boeing B-17's, and Douglas C-47's.

A few piston types are still being marketed, but the obvious trend is now for jet aircraft, emphasizing the increasing demand for modern, American-manufactured jets.

Military significance of this Pentagon operation is that:

- It costs the U. S. government virtually nothing. The word "reimbursable" means that the foreign countries pay for what they get.
- It provides a most economical means for equipping U. S. allies with air power which, of course, means greater protection and overall air strength for the western world.

Out of the $400 million received by this AF branch since its establishment under the Mutual Security Act of 1949, approximately three-fourths of it has come from Canada during the past few years.

Of particular importance, however, is the fact that about $75 million of the remainder has come from South and Central America, most of it recently. In recent months, Latin American countries have been the biggest AF customers for reimbursable assistance in a business that is beginning to mushroom.

(The rest of the $400 million—some $25 million—came from AF transactions with European and Far Eastern [illegible] The total [illegible] of reimbursable military assistance here is relatively small, since these nations have been receiving much grant aid under the Mutual Defense Assistance Program.)

Lt. Col. Ramsey

"We'll provide the best . . ."

Latin American interest in U. S.-produced jet aircraft came to a head last March when Colombia bought six Lockheed T-33 jet trainers from the AF for $1,162,000. A check-handing ceremony in the Pentagon established the first transaction in which a South American nation purchased a U. S. jet aircraft from the AF under the reimbursable assistance program.

This deal touched off numerous requests from South and Central American countries to buy U. S. jets.

At this stage, the AF has marketed more than two dozen jet planes down south. But more important, these countries are now putting up a mild clamor for more than 100 additional ones.

Types in greatest demand are Lockheed T-33's and North American F-86F's, with the greatest popularity b[illegible] Sabrejets. And in-

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Model of the T-33 jet trainer represents the purchase last spring of six full-size aircraft by the Colombian government. Shown are Capt. Jose R. Calderon, assistant Colombian air attache, Maj. Gen. Robert W. Burns, USAF assistant vice chief, Alfonso Patino, charge d'affairs of the Colombian embassy, and Col. Hector Materon, Colombian air attache.

cidentally, the T-33 trainers are being sold with full armament so that they may be used not only for jet flight training, but also for western hemisphere defense if the need should arise. In addition, some interest has been shown in Republic F-84G's.

AF jet sales to South and Central America to date included the six T-33's to Colombia, four T-33's to Cuba, and six T-33's and 12 F-84F's to another South American country *(the name of which cannot be disclosed at this time because of military security classification)*.

The AF is not interested in selling its obsolete planes, those which cannot receive continuous support, and discourages such purchases, according to Lt. Col. Robert L. Ramsey, chief of the AF's Reimbursable Military Assistance Branch.

"We'll provide the best material we have available as long as it doesn't bother our own air power buildup," Ramsey said. "We will not sell anything of obsolete or surplus nature that we can't support with subsequent spares, replacement parts, and proper maintenance equipment."

Ramsey's shop is one of many under Brig. Gen. John J. O'Hara, AF Assistant for Mutual Security, who in turn is under Lt. Gen. Bryant L. Boatner, AF Deputy Chief of Staff/Materiel. It functions under the Mutual Defense Assistance Program.

His office, which is operated by a small group of AF officers and civilians, has authority to deal with 60 eligible foreign nations and two international organizations, Supreme Headquarters Allied Powers Europe (SHAPE) and Supreme Allied Commander Atlantic (SACLANT) under provisions of AF Regulation 400-6.

It classifies the nations into "A" and "B" categories, both for major end items and support items. When a country is classified in category A for either major end items or support items, it may deal directly with the AF. When in category B, it must get State Department approval.

When AFR 400-6 was published, the normal procedure for payment was on a cash basis with the foreign governments requested to provide funds in advance. But recently, Congress passed a law which allows the AF to grant credit in reimbursable military assistance transactions. This is looked upon by Pentagon authorities as a big incentive to the short-of-cash countries seeking air power, and much additional business is anticipated as a result of the new ruling.

The new credit plan provides a maximum of three years for the countries to pay for equipment purchased. Only disadvantage of this system *(to the AF)*, is that the AF now has to do the financing out of its appropriations money, a procedure which may prove burdensome as such business expands and more AF money becomes tied up.

What is needed, according to Ramsey, is some type of special rotating fund, extra cash in addition to the military services' regular appropriations to provide financing under reimbursable military assistance.

When a country expresses interest in U. S. aircraft, Ramsey's office holds a preliminary discussion with a representative of the foreign government, usually the air attache. Then the nation makes a formal request to the U. S. embassy. Assuming that approvals are granted all the way down the line, the request goes through the Defense Department to the AF for action.

If State Department approval is needed, Ramsey's office refers the request to the State Department. The funding procedure or credit plans also has to be approved by the Foreign Operations Administration.

The country seeking the aircraft can usually receive a formal AF response on whether or not a deal can be made "in 30 to 40 days," Ramsey said. Delivery of the planes, of course, depends on numerous varied factors, such as the training programs and where the planes will come from, he added.

Comparatively late models may come out of current U. S. production or from the AF inventory. The six T-33's which Colombia purchased were taken off the production line at Lockheed Aircraft Corp., Burbank, Calif. To accommodate the Colombian order, the AF extended T-33 production at Lockheed.

In the case of North American F-86F's, which are no longer in production, the AF takes a close look at its own Sabrejet inventory to determine if some were available for sale. In most instances, there are some made available. This procedure blends in well with the AF modernization program, since the money received for the F-86F's can be used to buy more modern types for the AF, such as the North American F-100, McDonnell F-101, Convair F-102.

The T-33's and F-86F's provided are essentially identical in all respects to the same type planes flown in AF units. None of the equipment is classified.

Occasionally, Ramsey's office will be asked about planes which the AF has not purchased, such as the North American TF-86 or the so-called Lockheed T-33B, which the Navy has ordered *(designated the Navy T2V-1 with numerous changes from the T-33B version)*. Here, the AF reply is "we don't know" since they are not AF planes, often not in production, and no pricing is available.

The Navy and the Army, of course, have reimbursable military assistance programs similar to the AF's. But the Army naturally deals primarily in ground equipment, while the Navy sells mostly sea-going materiel and supplies. In a few instances the Navy has marketed aircraft, such as PBY seaplanes. • • •

Lockheed Will Carry On Connie Line With "World's Fastest" Turboprop

Lockheed Aircraft Corp. has reached a decision to carry on its Constellation line with a turboprop version of the Super Constellation, which also will have a new wing.

Designated the Model 1449, it will be ready to go into airline service in the spring of 1957. Lockheed describes the projected Super Constellation as "the world's fastest, long-range, most economical, propeller-driven transport." It will be powered by four Pratt & Whitney PT2 (T34) engines.

Lockheed's immediate plans call for the turboprop transport to be offered in a deluxe configuration for 64 passengers, adding only one row of seats even though 55 inches more length will be added in the cabin. All seats will be spaced 40 inches. A new, refined, Dreyfuss-styled interior will be installed.

The turboprop Super Connie will be capable of block speeds in the 400 mph area and will carry a payload in excess of 17,000 pounds more than 4000 miles at 30,000 feet. Fuel costs per mile, Lockheed says, will be 15% lower than contemporary high-powered, piston-engined planes.

Approximately 25 mph will be added to the cruising speed by the new, thin, high-speed wing, which also makes possible the plane's greater fuel capacity. It will carry 10,200 gallons of internal fuel in a four-tank system incorporating dual, single-point, underwing refueling.

The wing is a further development of the wing designed for Lockheed's military turboprop for the Air Force, the C-130. It has a higher aspect ratio, 12 vs. 9.17, and its root thickness-to-chord ratio is 16.7% lower. The wing incorporates integral stiffening from root to tip on both top and bottom surfaces. Other features include a new, improved beaded inner skin trailing edge design and anti-friction ball-bearing aileron hinges.

Cabin pressurization will be new to provide an 8000-foot cabin pressure at 30,000-feet airplane altitude. Engine bleed will drive air-driven turbines.

Lockheed goes to thermal anti-icing of wing and tail in the turboprop Super Constellation. The new landing gear is designed for use as dive brakes and it will retract in less than 10 seconds after take-off.

New flap system will feature a steel torque tube, gear box, and ball-bearing screw-jack mechanism operated by dual hydraulic motors. The new hydraulic system will have a completely independent dual pressure source, each system being operated by different pairs of engines.

Lockheed's choice of P&W's PT2 engine followed installation of the T34, its military counterpart, in the Navy R7V-2, which made its first flight last September. The engine, which is rated at 6000 hp, has had approximately 300 flight hours in various experimental aircraft to date.

Following are dimensions and design characteristics of the turboprop Model 1449 as compared to Lockheed's latest model piston-powered Super Constellation, the turbo compound Model 1049G:

	Model 1449	Model 1049G
Max. takeoff weight	175,000 lbs.	137,500 lbs.
Max. landing weight	123,000 lbs.	
Max. zero fuel weight	114,000 lbs.	
Fuel capacity	10,200 U. S. gals.	7,750 U. S. gals.
Power plant	P&W PT2 turboprop	Wright R-3350-DA4
Propeller	3 bladed, 16 ft. dia.	4 bladed, 13.5 ft. dia.
Fuselage length	118.2 ft.	113.6 ft.
Wing span	150.0 ft.	123.0 ft.
Wing area	1,856.0 sq. ft.	1,650.0 sq. ft.
Aspect ratio	12	9.17
Root thickness-to-chord ratio	15%	18%
Main gear tread	38.4 ft.	28 ft.

McDonnell's F-101A is capable of atomic missions

McDonnell Voodoo, Unveiled

The McDonnell F-101A Voodoo, supersonic long-range strategic fighter, has been publicly unveiled recently at McDonnell Aircraft Corp., St. Louis, Mo.

Powered by two Pratt & Whitney J57 turbojets developing about 20,000 pounds thrust, the F-101A is "believed to be the world's most powerful fighter plane," company officials said.

Its dimensions are: Span—39.7 feet; Length—67.4 feet; Height—18 feet. Both wings and stabilizer are swept back 35 degrees with the wing skin consisting of heavy, tapered, pre-formed sections.

First Air Force plane to go into production at McDonnell, the Voodoo carries most of its large fuel load in the fuselage and is capable of in-flight refueling. It is also an atomic weapons carrier.

The F-101A's will presumably be used to escort Strategic Air Command Boeing B-47 and B-52 bombers on long-range missions and to carry out atomic missions on their own.

Navy Cancels Contracts Worth $372 Million

The Navy canceled $372 million in orders for two plane types, the engines that power them, and related equipment.

McDonnell Aircraft Corp. lost $135 million in contracts for more than 200 F3H-2 Demons, including the night fighter and photographic versions. Chance Vought Aircraft, Inc., was cut $75 million in orders for 96 A2U-1 attack versions of the F7U-3 Cutlass.

Westinghouse Electric Corp., which builds the J46-WE18 engines powering the twin-jet A2U, suffered $75 million in cutbacks. Allison Div., whose J71-A2 powers the F3H, was reduced $36 million.

Remaining $51 million was divided among producers of radar, armament, and other equipment for the two planes.

SUPERSONIC TWINS. The Air Force has added a new rocket-powered aircraft for its continuing high-speed, high-altitude research program. The Bell X-1B is shown with its sister ship, the X-1A, at Edwards AFB. The experimental X-1A has attained a record speed of 1650 mph and a reported altitude of 90,000 feet.

PROCUREMENT NOTES

The Renegotiation Act expires January 1 with no visible plans for another extension of its annoying provisions. With its expiration, the Vinson-Trammell profit-limiting bill automatically comes into operation. This applies only to aircraft and equipment and naval vessels and is so involved and time-consuming that many aircraft companies would prefer the renegotiation law.

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Maj. Gen. T. R. Rampy, formerly USAF Auditor General and now Deputy Comptroller of the USAF in Europe, is busily engaged in establishing auditing teams to supervise expenditures for off-shore procurement and in maintenance factories in Germany. Civilian nationals under American supervisors are employed whenever possible.

• •

It is reported that the Military Air Transport Service will be reorganized within the next several months. It is also said that a special report of the Cooper fiscal committee recommended that MATS install a "double-entry commercial-type accounting system." For both efficiency and economy, an "industrial fund cost system" was suggested.

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The General Accounting Office, in its forthcoming report to the new Congress, is expected again to suggest that, now that the Korean emergency is over, more military contracts be let on a bid basis. Former Comptroller General Lindsay Warren, in his last report to Congress, strongly urged this action and said that 90% of the funds for military procurement were spent on a negotiated price basis.

Industry is hoping for a new, simple directive on "true depreciation" for emergency facilities. Some Pentagon officials say the last one was of an interval variety and was by necessity very long and complicated. Few in industry understand it.

• •

Navy Secretary Charles S. Thomas has just returned from Spain after inspecting plans for airports and naval bases the Bureau of Yards and Docks is building in that country. The efficient assistant comptroller, N. P. Cassidy, and his assistant, John Plott, accompanied the Secretary. The Navy is taking no chances on wasting funds in this operation.

Capital and ALPA Sign Turboprop Agreement

Capital Airlines and the Air Line Pilots Association signed the first labor agreement in the U.S. covering turboprop aircraft. Effective Jan. 1 for two years for Capital's forthcoming Vickers Viscounts and for one year for other planes, the pact includes a "technological unemployment" clause which will provide severance pay for pilots laid off for more than 60 days.

The severance pay provision, which ends four years after the 40th Viscount is delivered, does not apply to pilots furloughed for other reasons.

The contract provides that the Viscount will be pegged at 300 mph for hourly pay purposes and 310 mph for mileage purposes. ALPA had sought to get the four-engine turboprop pegged at 335 mph (10 mph faster that the DC-7 in United Air Lines' contract) and thereby set a new scale, but failed.

India Service Continues

Pan American World Airways and Trans World Airlines should be able to continue operating to and through India after Jan. 14 when the present U.S.-India bilateral air transport agreement expires. A formula has been proposed which would provide for service to continue pending negotiation of a new bilateral. This was worked out at a recent meeting of representatives of PAA, TWA, CAB, and State Department. Should the formula not succeed, PAA and TWA would continue operating to and through India, but would not enjoy traffic rights.

NEWS BRIEFS

The helicopter's usefulness as a charter vehicle has been described by **Rick Helicopters** and affiliates. The group of four companies has done a gross business of $3.5 million during the last seven years, and has seen its copter fleet climb from two to 22. Half the work has been Alaskan aerial mapping. Secret of success: lots of spares, insuring high utilization . . . **Fairchild Engine & Airplane Corp.** has hired Col. Harry Hardsog (USA-Ret.) to conduct research into excitation of the carbon atom, object being discovery of some means to obtain more power from carbon sources, such as fuels . . . A one-man helicopter powered by an outboard motor has been demonstrated to the Navy by **Goodyear Aircraft Corp.** Designated the GA-400, the rotorcraft grosses just over 400 pounds, was company financed, and is powered by a 25 hp Johnson outboard. It is not entered in the current competition for a Marine Corps one-man copter . . . The millionth "Mighty Mouse" 2.75-inch aircraft rocket has been delivered to the Navy by **Hycon Manufacturing Co.** of Pasadena . . . The **Flight Safety Foundation** has presented its annual awards to Lt. Col. John P. Stapp (USAF) for research on rapid deceleration of the human body, to CAA's Technical Development and Evaluation Center for evaluation of fire detection equipment, and to United Air Lines for work on anti-collision lights . . . Winner of the **USAF's Cheney Award** for 1953 is Capt. Edward G. Sperry for his work on ejection methods for use in jet bombers. Sperry was injured last year during one such test.

Boeing Jet Begins to Mean Dollars To the Industry

PRODUCTION on Boeing's jet transport/tanker moved ahead last month as major subcontracts were handed out for work on the USAF's tanker version, the KC-135. Among the firms receiving orders were:

- Vertical fin and rudder—Twin Coach Co., Aircraft Div., Buffalo, N. Y.;
- Aft body and stabilizer torque box—Ryan Aeronautical Co., San Diego, Calif.;
- Main landing gear—Bendix Aviation Corp., South Bend, Ind.;
- Nose gear—Menasco Mfg. Co., Burbank, Calif.;
- Engine struts and pods, horizontal stabilizer, elevator assemblies—Rohr Aircraft Corp., Riverside, Calif. The $9 million contract, which extends well into 1957, brought Rohr's total backlog to more than $122 million.

As such new aircraft began moving closer to the assembly lines, the customers began taking stock of their ability to buy them. Delta-C&S Air Lines, arguing for extension of its southern routes to the Washington-New York area, predicted that it would put $12.5 million into new flight equipment if the routes were granted. On top of this investment would come over $800,000 in real estate, part of a program of expansion that the carrier's financial advisers have found sound.

On the military side, dollar signs were flying during the first three months of the fiscal year. The Navy and Air Force, up to the end of September, ordered aircraft and related equipment worth $973 million (USAF: $711 million; Navy: $262 million). In terms of money actually paid out, the two services spent a total of $2 billion (USAF: $1.57 billion; Navy: $435 million). When the second quarter opened the two services had $9.54 billion still available for the placing of contracts, and $24.9 billion left for payments.

CONTRACTS

Douglas-El Segundo received a Navy contract for $13.4 million in armament fire control systems.

Allison will overhaul J35 jet engines for the Air Force to the tune of over $1 million, under terms of a recently issued Air Materiel contract.

Small businesses will begin receiving the help of a network of 60 Navy procurement specialists who have been placed in every Navy bureau and in main procurement field offices to help the smaller firms obtain contracts.

Airwork Ltd., British carrier, has ordered a third DC-6A from Douglas, with delivery scheduled for 1956.

Trans World Airlines has ordered 20 Sperry airborne ignition analyzers for its new L-1049G Super Connies.

Cornell Aeronautical Laboratory, non-profit subsidiary of the university, has announced an estimated backlog of $12.35 million, as of the end of the year. The total is up $2 million over last year's figure. The laboratory's transsonic wind tunnel alone has a record $3.2 million backlog.

VOLUME DELIVERY. Fifty New 1955 Model 170 Cessna single-engine business aircraft are assembled at Cessna's Pawnee plant for volume delivery. New model sells for $8295 FAF Wichita.

PROFIT & LOSS

General Dynamics Corp. showed a nine-month net income of $12.8 million, up 37% over the similar period in 1953. Sales were up slightly, from $430.8 million to $431.0 million. Backlog as of Sept. 30 was $923 million, with an additional $410 million under negotiation.

Curtiss-Wright Corp. netted a profit of $11.5 million after federal income taxes for the nine months ended Sept. 30, up from a comparable net of $8 million for last year's period. Sales rose from $317.9 million to $348.3 million. Backlog was $736 million on Sept. 30.

Capital Airlines took in a net profit of $1.19 million during the 10 months ended Oct. 31, down from $1.39 million in 1953. Revenues rose from $38.5 million to $40.4 million, but climbing expenses more than offset the increase.

British Commonwealth Pacific Airways lost over $415,000 during the year ended March 31, an improvement over the $637,000 loss of the previous year. BCPA was taken over by Qantas Empire Airways on April 1.

Southwest Airways earned over $115,000 after taxes during the first nine months of 1954, with load factors in its Martin 2-0-2's running 60%, expenses down 8%, and charter and contract operations up 30%. The earnings were achieved despite the closing of a number of Army camps in SWA's area.

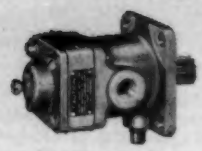
National Airlines reports record revenues of $9.23 million for the quarter ended Sept. 30, up from $7.53 million for the same period last year. Operating expenses were also up, rising from $7.32 million to $9.10 million. A net of $65,000 was recorded for the quarter, although the figure would have been $130,000 higher under earlier accounting methods.

Western Air Lines earned a net of $766,000 during the third quarter of the year, up from last year's $636,000 for the same period. During the first nine months earnings were off slightly, down from 1953's $1.048 million to the current $1.037 million. A record final quarter is predicted.

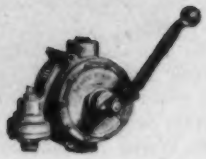
Northrop Aircraft reports net profit up 483% for the quarter ended Oct. 31

Do you know all these g

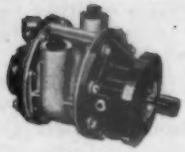
Engine driven fuel pumps
(military aircraft type)
Model RG-9080 illustrated



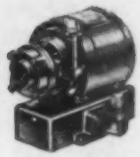
Engine driven fuel pumps
(commercial aircraft type)
Model RD-7420B illustrated



Hand operated fuel pumps
(aircraft)
Model RD-4370 illustrated



Engine driven vacuum pumps
(aircraft)
Model RD-3870B illustrated



Oil-free air pumps
(aircraft, AC-motor)
Model RG-8160-1A illustrated

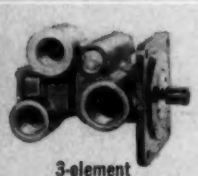
Camera vacuum pumps
(aircraft)
Model RG-7730-1A illustrated

Pneumatic motors
(aircraft)
Model RD-7440A illustrated

Absolute pressure switches
(aircraft)
Model RG-8395 illustrated

Bilge and refueling pumps
(aircraft, portable)
Model RR-9110 illustrated

Anti-detonant injection pumps
(aircraft)
Model RR-9700B illustrated

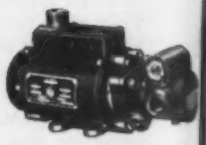


3-element lube and scavenge pumps
(gas turbines)
Model RG-9990 illustrated

Hydraulic oil booster pumps
(aircraft)
Model RG-9460D illustrated

Oil transfer pumps
(aircraft)
Model RG-9840 illustrated

Electric hydraulic pumps
(aircraft)
Model RG-10430 illustrated



12-V fuel booster pumps
(aircraft, line type)
Model RG-10340A illustrated

Model RR-11050 (B-18B type) submerged fuel booster pump

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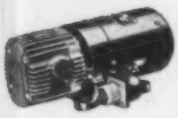
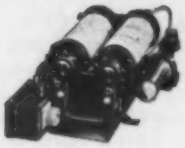


Oil-free air pumps
(aircraft, DC-motor)
Model RG-9065 illustrated

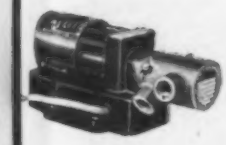


Bombsight dessicators
(aircraft)
Model RR-10040B illustrated

Radar pressurizing kits
(aircraft)
Model RR-10200B illustrated

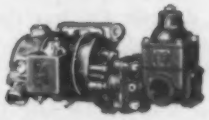
Pressurization control panels
(aircraft)
Model RR-10370 illustrated

Ground pressurizing kits
(aircraft, radar)
Model RR-9500B illustrated



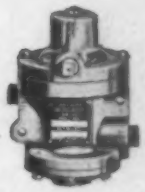
ectric fuel scavenge pumps
(aircraft)
Model RG-9440 illustrated

Heater fuel pumps
(aircraft)
Model RG-9540 illustrated



Fuel transfer pump
(aircraft, line type)
Model RG-7900-2A illustrated

Fuel filter deicer alcohol pumps
(aircraft)
Model RG-5490C illustrated

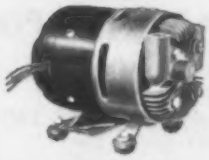


Pressure regulator valves
(aircraft)
Model RD-10120 illustrated

eumatic actuating cylinders
(aircraft)
Model RD-10400 illustrated

Ethylene glycol and
coolant pumps (aircraft)
Model RD-9860-D illustrated

Water pumps
(industrial)
Model RD-7250 illustrated



Oil-free air pumps
(industrial)
Model RG-5860A illustrated

Barrel pumps
(industrial, hand and electric)
Model RD-6950A illustrated

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LEAR-ROMEC DIVISION

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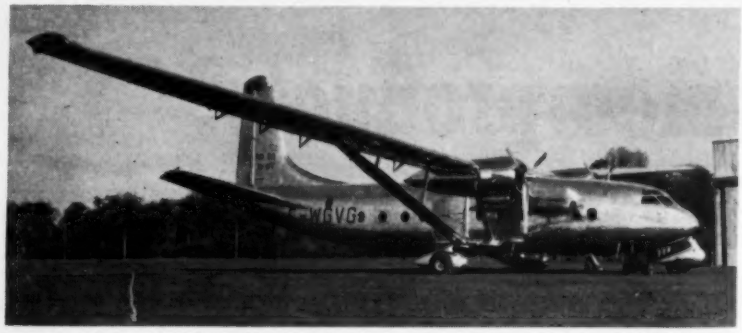


FITTED WITH ITS NEW SINGLE TAIL (previously it had a twin unit) the Hurel-Dubois HD 32 resumed its flight test program last month. The French twin-engine "DC-3 replacement" is likely to be produced in quantity by SNCA du Sud-Est.

BUSINESS . . . Continued

over the 1953 figure: $2.99 million vs. $512,000. Sales were up only 84%. The profit is not expected to remain at that level throughout the rest of the year. Backlog on Oct. 31 was $430 million, down from the $512 million of three months before.

Menasco Manufacturing Co. netted over $226,000 during the first quarter of the fiscal year, up from last year's $125,000. Sales rose from $4.29 million to $4.56 million. Sales are expected to slack off later in the year. Backlog stands at $20 million.

DIVIDENDS

American Airlines directors have declared a 15¢ dividend on $1 par value common stock, payable Dec. 20 to stockholders of record Dec. 3.

Solar Aircraft Co. has declared a quarterly dividend of 25¢ per common share, payable Jan. 15 to stockholders of record Dec. 31.

Chance Vought Aircraft, Inc., will pay a dividend of 40¢ a share on Dec. 15 to common stock of record Dec. 1.

PULSE OF THE INDUSTRY

As Aircraft Get Heavier, Production Figures Rise

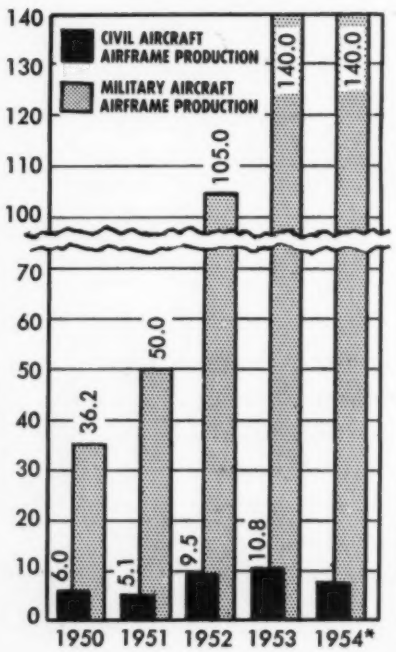
The rise in airframe production figures, reflected in the accompanying bar graph, can be attributed only partly to increased numbers of aircraft. A good part of the rise is due to the increased weight of the aircraft produced.

Planes today are bigger and heavier than they were in 1944 when 96,318 military airframes were produced weighing 962,400,000 pounds—an average of nearly 10,000 pounds per airframe. Today the figure approaches 12,000 pounds.

The military airframe figure for 1954 is an estimate based on commitments by the military and rates of production in recent years.

Civil aircraft airframe weight rose from 700 pounds in 1945 (when civil aircraft production was resumed after World War II) to nearly 2300 pounds per airframe in 1953.

AIRFRAMES . . . in millions of pounds



***IN GRAPH, right, figure for civil aircraft production in 1954 (black bar) reflects first seven months only; figure for military airframe production is estimated. Information source: Aircraft Industries Association.**

Lewis Says AF Buying Will Be Halved

The trend in Air Force buying will be downhill from now on, and by two years from now the USAF program will stand at half its present level, the industry has been informed by Roger Lewis, Assistant AF Secretary *(Materiel)*. The 50% level, when it is reached, will be sufficient to maintain the Air Force "in a high and continued state of readiness," Lewis told a meeting of the Aviation Distributors and Manufacturers Assn.

Lewis cited the need for high quality in USAF equipment but cautioned, "It is better to have a reliable piece of equipment less than the best," than to have a better piece of equipment out of service for frequent technical changes.

Douglas Reshuffles Military Sales Office

The military sales department of Douglas Aircraft Co. will be renamed the military relations department on the first of the year, coincident with extensive personnel shuffling. The department's responsibilities will also be broadened, to take in administration of the Washington and Dayton offices.

Donald W. Douglas, Jr., now v.p. of military sales, becomes v.p. of military relations. R. L. Hoskinson, asst. director of flight and testing, becomes director. C. R. Able, now Dayton representative, will move to Santa Monica, becoming director of military relations. His post in Dayton will be taken by A. V. Guillou, now an assistant Washington representative. H. E. Hjorth, now in Santa Monica as assistant to the v.p. of military sales, takes Guillou's place in Washington.

CAA Moves to Control "Gyp" Parts Firms

Regulation of "gyp" aircraft parts manufacturers may be undertaken by CAA if enough support is forthcoming from the industry. The "gyp" firms copy spare parts made by original manufacturers and then undersell both them and their distributors. They are currently unregulated.

The CAA plan under consideration would certify this group in order to regulate it, according to George Jalonick of Southwest Airmotive Co. Jalonick, addressing a meeting of the Aviation Distributors and Manufacturers Assn., urged members of the group to support the idea by writing the CAB, which is reportedly not eager to launch the project.

ALPA LIBERALIZES ITS STAND ON THE 8-HOUR RULE

BY ROBERT M. LOEBELSON

Clarence N. Sayen
Re-elected with a boost

CHICAGO—Integration of pilot seniority lists, a perennial problem whenever two airlines merge, may have been permanently settled at the 13th biennial convention of the Air Line Pilots Association at the Shoreland Hotel here.

The biggest internal problem in the pilot union—a situation which also has had many external ramifications in such mergers as Slick-Tigers, Pan American-American Overseas, Braniff-Mid Continent, and Delta-Chicago and Southern—has moved much closer to solution through new merger machinery set up by the delegates.

At the same time, ALPA's board of directors went a long way toward a peaceful solution of the controversial eight-hour flight rule, liberalizing their previously inflexible stand of being "unalterably opposed" to flights of more than eight hours and permitting negotiations with American, United, and Trans World airlines for longer flights.

In authorizing resumption of negotiations on the eight-hour rule, delegates imposed three conditions, all of them partially based on the interim recommendations of neutral David L. Cole, arbitrator in the ALPA-American dispute. A resolution passed on the floor told negotiators to make certain:

- "That any terms and conditions with relation to the . . . non-stop transcontinental flights are for the interim period only until all flights may be brought within the eight-hour rule.
- "That of the conditions suggested by neutral David L. Cole, it is the sense of this convention that it attaches the greatest weight to the multiple crew concept.
- "That such negotiations shall be conducted with full cognizance of the policies of the Association and for the purpose of strengthening and implementing such policies and that, while it is not compulsory that identical terms and conditions shall be concluded covering the pilots of different air lines on this subject, such conditions should nevertheless be similar and have as their object the reinforcement of the policies of this Association."

(The reference to the multiple-crew concept, floor discussion indicated, would involve a third pilot on non-stop transcontinental flights lasting more than eight hours. ALPA's "unalterably opposed" policy was changed by the resolution to have the union "affirm its adherence to the standard of eight hours flight deck duty for any pilot in domestic and international aviation.")

ALPA—PEOPLE AND MONEY

Membership (Nov. 1, 1954)—12,182, including 9449 actives.

Average income (1954)—$11,262.

Average income (1953)—First pilots $14,415, copilots $8271.

Average income (local service airlines 1953)—First pilots $10,508, copilots $5439.

Average income (1946)—First pilots $8287, copilots $3480.

Hours Flown (April 1954)—78:21

Hours on Duty (April 1954)—137:42

Hours away from home (April 1954)—240:24

In setting up a procedure for integrating pilot seniority lists of airlines planning to merge, ALPA is trying to avoid the use of outsiders. If a first pilot and co-pilot representative from the master executive council from each of the affected airlines cannot agree on a single list, ALPA's president can intervene as a mediator. If negotiations and mediation have been fruitless 45 days after CAB approval of the merger, arbitration is mandatory.

Arbitration board will be made up of the two representatives from each airline pilot group, two neutral pilots selected by these representatives from an ALPA list, and one neutral chosen by the pilots representatives. If no neutral proves satisfactory to both sides, the government's National Mediation Board will be asked to designate the neutral member.

Only the two neutral pilots and the agreed-upon outside or NMB neutral will vote. A majority vote will decide the issues and the binding decision will be made within 120 days of CAB approval.

Meanwhile, all pilots will vote by next Feb. 1 as to whether they want their airline's seniority list (in case of merger) to be based on either: (1) Length of service with their respective carriers; or (2) Problems and factors peculiar to the merger.

Another controversial resolution approved after some debate represents ALPA's attempt to convince the CAB and others that it wants no compulsory use of radar. The board of directors voted to tell domestic pilots not to use the authority granted in Civil Air Regulation 40.406 (c) for instrument approaches.

CAR 40.406 (c), the so-called "take a look" rule, presently reads: *"An instrument approach procedure may be executed when the weather report indicates that the ceiling or visibility is less than the approved minimum for landing, if the airport is served by ILS and GGA in operative condition and both are used by the pilot, and thereafter a landing may be made, if weather conditions equal to or better than the prescribed minimums are found to exist by the pilot in command upon reaching the authorized minimum altitude."*

After noting that the restrictive condtions in the CAR "are not acceptable to the Association" and declaring that "an airline pilot should have the right to complete any approach, regardless of the official weather report, if he finds the actual weather to be at or above minimums," the resolution established a policy "that members of the Association shall not utilize the authority presently granted by CAR 40.406 (c) for domestic operations." *(Under this resolution, pilots on U.S. flag carriers may still "take a look" because of differing instruments and conditions.)*

The pilot delegates ignored a proposal which could have resulted in a complete shutdown of air transport if a strike similar to last August's walkout against American Airlines should recur. The proposal called for all pilots to respect ALPA picket lines one week after a strike began.

In other actions, delegates:

• Reelected Clarence N. Sayen president and F. A. Spencer secretary and chose C. E. Beatley of Capital Airlines first vice president and D. J. (Snuffy) Smith of TWA treasurer.

• Increased Sayen's annual salary to $24,000 plus $3000 for extraordinary expenses and $3000 more for a retirement plan.

• Voted down plans to spend $75,000 for political action and $20,000 for each of the next two years to improve ALPA public relations. *(Sayen interpreted this, however, as leaving the decision on how much to allocate for these purposes to his discretion.)*

• Went on record favoring permanent certificates for local service airlines and other temporarily certified scheduled carriers. ALPA will lobby for permanent certificates for feeders, cargo lines, insular and territorial carriers, and helicopter services when legislation is introduced in the 84th Congress.

• Readmitted National Airlines pilot E. J. Kershaw to active membership. Kershaw and other pilots who engaged in "strikebreaking" during the 1948 strike were barred from membership forever at the 1948 convention. Kershaw was an NAL official before, during, and after the walkout.

• Expressed their opposition to the serving of liquor or setups on aircraft. They cited "incidents" in which passengers allegedly became tipsy enough to threaten the safety of the flights.

ALPA'S NEW DUES STRUCTURE

(Based on 1½% of Gross Income)

Dues Bracket	*Income (Gross)*	**Annual Dues*
1-4	*$ up to— 4,000*	*$ 60*
5	*4,000— 5,000*	*75*
6	*5,000— 6,000*	*90*
7	*6,000— 7,000*	*105*
8	*7,000— 8,000*	*120*
9	*8,000— 9,000*	*135*
10	*9,000—10,000*	*150*
11	*10,000—11,000*	*165*
12	*11,000—12,000*	*180*
13	*12,000—13,000*	*195*
14	*13,000—14,000*	*210*
15	*14,000—15,000*	*225*
16	*15,000—16,000*	*240*
17	*16,000—17,000*	*255*
18	*17,000—18,000*	*270*
19	*18,000—19,000*	*285*
20	*19,000—20,000*	*300*

** Members can reduce their dues 10% by paying a year in advance rather than quarterly.*

• Decided to press for the payment of Universal Postal Union mail rates to U.S. flag carriers. These airlines now get mail pay set by the CAB while competing foreign carriers receive compensation at UPU rates which are considerably higher. If flag carriers were paid the same sums as their foreign competitors for flying mail between the same points, their subsidy needs would be much lower.

• Resolved to try to safeguard working conditions by establishing a definite relationship between flight time and on duty time for pay and flight time credit purposes. Included would be increased compensation for flights made between midnight and 6 a.m.

In actions on the technical side, ALPA's board of directors also voted to:

• Urge the extension of the USAF Air Defense Command's radar weather advisory service to all areas where the required facilities are available or can be obtained.

• Favor the installation of an apparatus to record gust loads, structure and mechanical failures on aircraft aloft.

• Continue to oppose Planned Position Indicator (PPI) as well as precision GCA as primary means of approach. Inform CAA that ALPA objects to attempts by CAA or others to force or foster the use of PPI approaches except in emergency or on request.

• Continue to demand the right of each pilot to refuse radar traffic control and point out to CAA that there will be more such refusals unless greater emphasis is placed on safety and less on volume of traffic.

• "Insist strongly" that airborne radar especially adapted to give a pilot information on turbulence circumnavigation, evasion of icing areas, and terrain clearance be installed in commercial aircraft "as soon as possible."

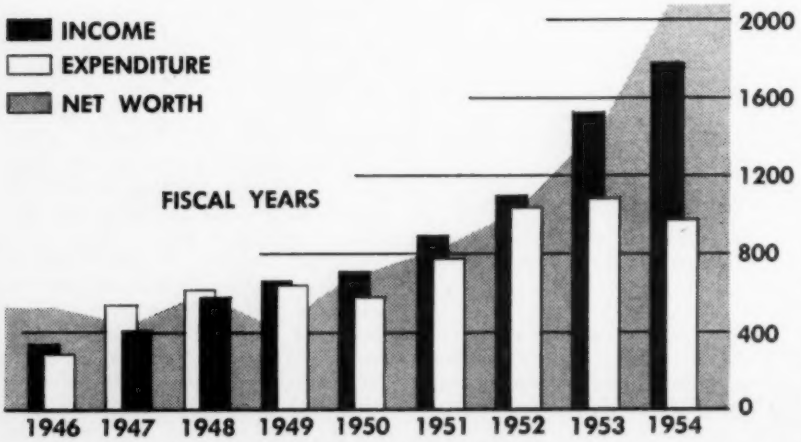
• Adopt a policy favoring the extension of air route traffic control to all routes and airports served by a scheduled airline.

• Draw attention to: (a) Narrowing the wide zone of aircraft speeds in control zones by declaring a 'control zone speed' for each plane type; (b) The need for airborne radar, preferably with automatic warning, to prevent mid-air collisions.

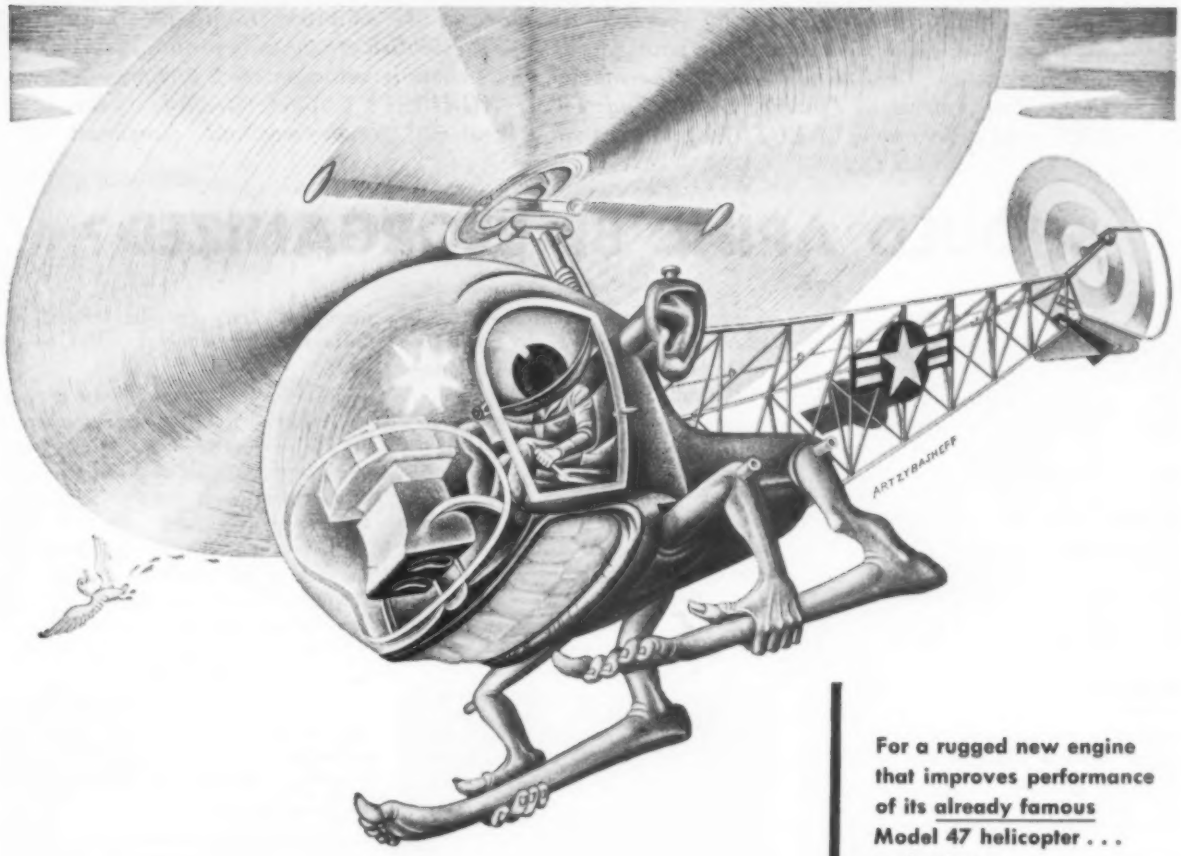
• Favor continuation of automatic monitoring but provide for amendment if tests prove this policy undesirable. Oppose any requirement which would require a pilot to listen to the monitor when he feels that this would detract from the safety of his flight.

• Continue to strive for a goal of 100% temperature and humidity accountability. *(This was obviously designed as a reference to the Capital Viscount certification problem. The delegation noted on this resolution, however, that the policy should not be interpreted "so as to prevent negotiation and consolidation of partial gains as progress is accomplished toward this goal.)*

• • •



This is ALPA's financial record.



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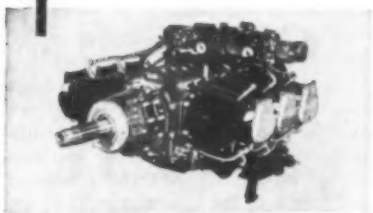

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Circle No. 73 on Reader Service Card.

Twelve airlines represented on the board of directors of Aeronautical Radio Inc. may soon weigh a major reorganization plan which would establish Arinc as a profit-making aviation utility. This is how one airline official views their position on such a change— FOR: Pan American, Eastern, United and TWA; AGAINST: Capital, Braniff, Delta-C&S and Piedmont; NEUTRAL: American, Western, Northwest and Northeast

SHOULD ARINC BE REORGANIZED?

BY JOSEPH S. MURPHY

A MAJOR policy split among scheduled U. S. air carriers, the outcome of which may have far-reaching effects throughout aeronautical communications and navigation circles, is now in the formative stages.

At issue is the future status of Aeronautical Radio Inc., one of the most successful of airline joint ventures which for 20 years has stood as a powerful voice in aviation communication and navigation matters. The current dispute is the outgrowth of a move to reorganize Arinc into a profit-making aviation public utility, a plan reportedly championed by President J. S. Anderson and backed by a nucleus of big airlines represented on the board of directors.

Openly opposed to such a venture are a number of smaller trunk and feeder carriers which feel that Arinc has already grown far beyond the scope for which it was initially set up. Still on the fence is a third group of airline representatives which has remained relatively silent in the controversy but which holds the balance of power in swinging Arinc's future one way or the other.

Proponents of the plan to change Arinc contend that if such a step is not taken there is a danger that airline communications and navigation facilities will fall behind and eventually become a bottleneck to the future growth of the industry. This would not be the case, they feel, if Arinc were a profit-making business which could expand and modernize to keep ahead of industry growth.

But this view is not shared by all members on the current board of directors. As one airline spokesman puts it, aeronautical communications are presently adequate and have historically been more advanced than other areas of airline technical development. Other objections they cite are:

• **Higher Costs**—The federal communications tax, not levied under the present Arinc arrangement, would hike airline costs. This added to a profit for the new Arinc might mean the difference between profit and loss for smaller carriers, one airline representative estimates.

• **Lower Efficiency**—Present airline maintenance of equipment leased and licensed through Arinc allows for flexible use of personnel where the equipment doesn't call for full-time attention. A completely separate Arinc force, they feel, would not be as efficient, and hence would further increase costs.

The spark that touched off the present disagreement came in August when Arinc's executive committee authorized an agreement with the consulting firm of Arthur D. Little Inc. of Cambridge, Mass., for a $60,000 "technical and business" study of airline communications. It also called for development of a plan that would best serve the communications requirements in domestic aviation for the next 10 years.

John S. Anderson

Profit-making utility sought

Board members opposing the change in Arinc, on learning of the agreement, viewed it as a direct move to gain outside support for the reorganization plan and immediately sought a special board meeting in September. Although they reportedly entered that session weighing such drastic measures as replacement of President Anderson, no such action developed. This was attributed by one airline official primarily to the unwillingness of the "neutral" airlines to take sides on the issue.

At that time, some of the pressure was removed from the economic aspects of the executive committee's action when Arinc officials disclosed a pending arrangement with the Air Navigation Development Board under which ANDB would, in effect, withstand half the cost of the Little study. An Arinc-ANDB contract finalized shortly after the special meeting provided that ANDB receive 100 copies of all study reports at a cost of $30,000.

ANDB interest in the outcome of the study becomes obvious when one considers its scope. This includes:

• An analysis of current airline communications.

• Projection of communications requirements for the next 10 years.

• Examination of equipment and systems which can be considered in future communications requirements.

• Formulation of a system plan or plans.

• Evaluation of business aspects based on technical findings, including a recommendation as to the type and structure of organization that could best provide the service.

With the study not due for completion until early next year and the next move in the controversy apparently hinging on its findings, no action can be expected at the forthcoming board meeting in December. This will not be the case, however, at the next annual stockholders meeting scheduled for March 1955.

At that time, with the study results presumably on hand and the position of the so-called "neutral" carriers swayed one way or the other by its recommendations, the field of aeronautical communications may see some drastic changes. Just what these changes will be and what impact they will have on airline operations can only be told then. In the intervening months, top airline officials who hold the key to the future role of Aeronautical Radio Inc. will be pondering a decision that should provide the answers. • • •

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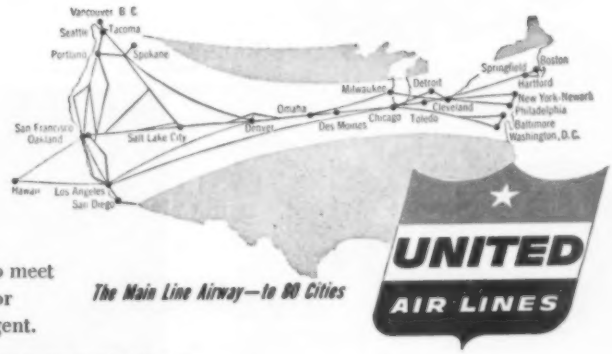

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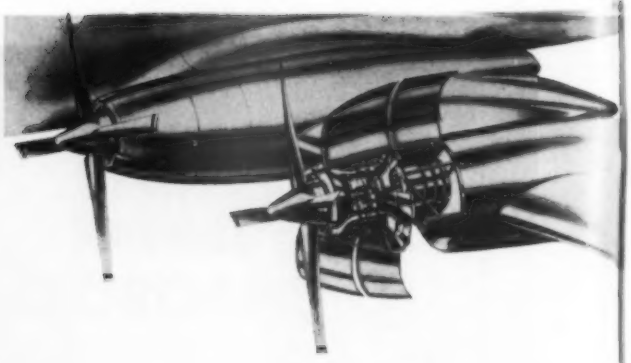


BRISTOL BEGINS DRIVE TO SELL U.S. ON BE25

• Dimensionally suitable for installation in most modern transport designs, the supercharged turboprop will first appear in Bristol's own Britannia

BY ANTHONY VANDYK

A BIG DRIVE to sell the U.S. on Britain's supercharged turboprop, the Bristol BE25 (AMERICAN AVIATION, *September 27*), was begun last month when a team of engine specialists from the Bristol Aeroplane Co. toured American aircraft and airline companies.

Heading the team was Air Commodore F. Rodwell Banks, largely credited with the success of Britain's postwar aircraft gas turbines. He was in charge of engine development for the British government during much of World War II and again from 1952-54.

Banks, appointed to the Bristol board of directors a few weeks ago, explained that Bristol's experience with large turboprops, gained in the development and production of the Proteus, is going to pay off in a big way with the BE25.

Advantages listed

He told the companies that the BE25 has a specific fuel consumption of as little as 0.385 lb/ehp/hr (at 350 knots at 36,000 feet), equal to the most advanced piston engine. Yet it has the added advantage of low installed weight in relation to its cruising power. The engine's dry weight (including oil tank, oil coolers, rigid mounting units, and starter) is 3058 pounds.

The BE25 provides constant shaft power for take-off regardless of ambient temperature at airfield altitudes up to 5000 feet under "tropical maximum" conditions. Low fuel consumption is maintained when cruising with reduced power. These characteristics result from use of a high compression ratio in conjunction with a high level of component efficiency.

Two-spool compressor

The use of the compound or two-spool compressor for obtaining high pressure ratios has already been successfully developed by Bristol and proved on the company's Olympus turbojet. Component efficiencies assumed in the assessment of the engine performance *(see charts)* are currently achieved on rig tests.

The BE25 is a relatively simple engine of the direct entry type. The air enters an annulus surrounding the reduction gear and passing into the low-pressure compressor where the greater part of the total compression takes place. On leaving this compressor the air passes through an intermediate case (the supporting vanes of which house accessory drives and oil pipes) into the high-pressure compressor. It then passes through the delivery casing into a tubo-annular combustion system in which there are 10 chambers.

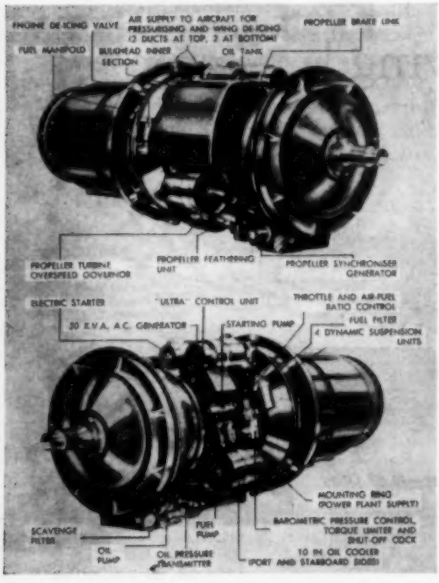
The turbine comprises four stages. The first drives the high-pressure compressor; the other three drive the low-pressure compressor and provide power through the reduction gear for the propeller.

Modest in size

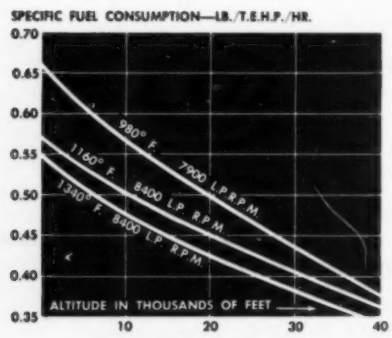
With a length of 110.3 inches and a diameter of 41.75 inches, the BE25 is modest in size and can be installed in existing four-engine long-haul transports that are stressed for the kind of speed that the engine makes possible. At maximum cruising rating (36,000 feet, 350 knots, ISA conditions) the following performance results: low-pressure compressor rpm—8860; turbine entry temperature—1000K; high-pressure compressor rpm—8700; air mass flow lb/sec —25.8; total equivalent horsepower—3080; fuel flow lb/hr—1185; specific fuel consumption 0.508 lb/shp/hr or 0.385 lb/ehp/hr.

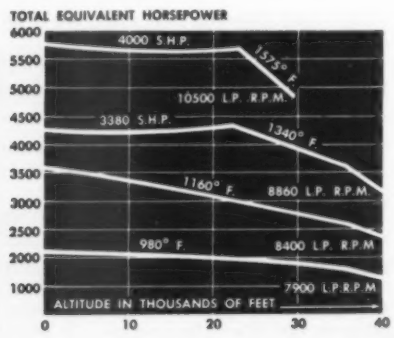
For take-off the BE25 delivers a

Mock-up shows BE25 features


ENGINE DE-ICING VALVE
AIR SUPPLY TO AIRCRAFT FOR PRESSURISING AND WING DE-ICING (2 DUCTS AT TOP, 2 AT BOTTOM)
PROPELLER BRAKE LINK
FUEL MANIFOLD
BULKHEAD INNER SECTION
OIL TANK
PROPELLER TURBINE OVERSPEED GOVERNOR
PROPELLER FEATHERING UNIT
PROPELLER SYNCHRONISER GENERATOR
ELECTRIC STARTER
"ULTRA" CONTROL UNIT
THROTTLE AND AIR-FUEL RATIO CONTROL
30 K.V.A. A.C. GENERATOR
STARTING PUMP
FUEL FILTER
4 DYNAMIC SUSPENSION UNITS
MOUNTING RING (POWER PLANT SUPPLY)
BAROMETRIC PRESSURE CONTROL, TORQUE LIMITER AND SHUT-OFF COCK
SCAVENGE FILTER
FUEL PUMP
OIL PUMP
OIL PRESSURE TRANSMITTER
10 FH OIL COOLER (PORT AND STARBOARD SIDES)

Charts below show performance of BE25.





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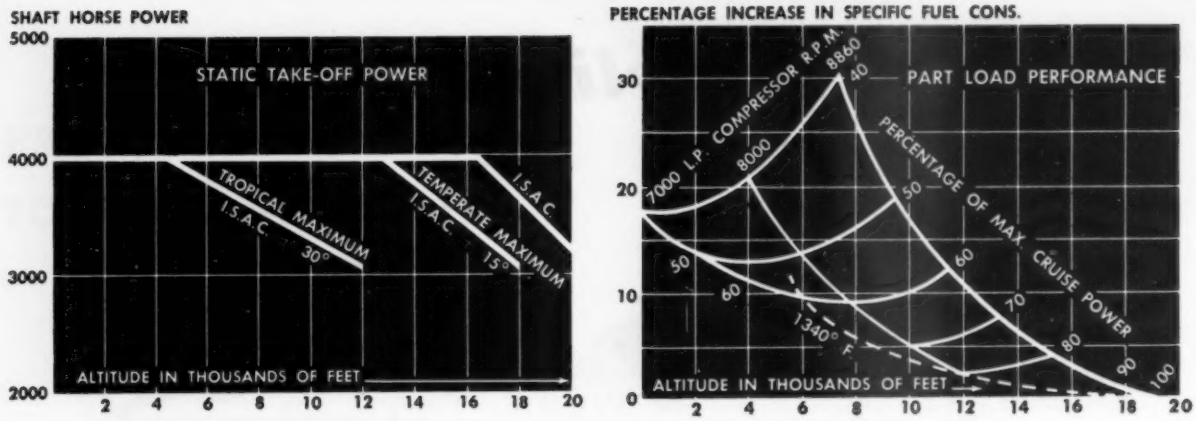


Performance of Bristol's BE25 is designed for the long-haul field.

constant shaft horsepower of 4000 at the maximum low-pressure rpm of 10,500 under all climactic conditions.

The BE25 is still in mock-up state, although many of the components have accumulated long periods of test running. The engine is due to go on the test bed next year and should be available in production quantities two or three years later. Destined to power the thin-wing, stretched-fuselage "Super Britannia," the BE25 is Bristol's bid to duplicate in the long-haul field Vickers' success in the short/medium-haul bracket. • • •

R3Y's ARE PASSING THEIR TESTS —

Convair's R3Y turboprop flying boats have accumulated in excess of 125 hours of flight time in the company's test program at San Diego. Reports indicate a minimum of engine trouble in recent flights.

Navy's order for the big 350 mph transports is for five R3Y-1's and six R3Y-2's. Latter is the bow loader. Four R3Y-1's and one R3Y-2 have been flown.

One R3Y-1 test flight in excess of eight hours was made to check engine and propeller performance for a non-stop flight from San Diego to the Naval Air Test Station at Patuxent, Md. Plane is due in Patuxent for a Navy test program in January. One R3Y-2 also will go to Patuxent later for Navy test. The boats are scheduled to be put into service by the Navy some time next year, succeeding the Mars equipment on the run between Alameda, Calif., and Hawaii.

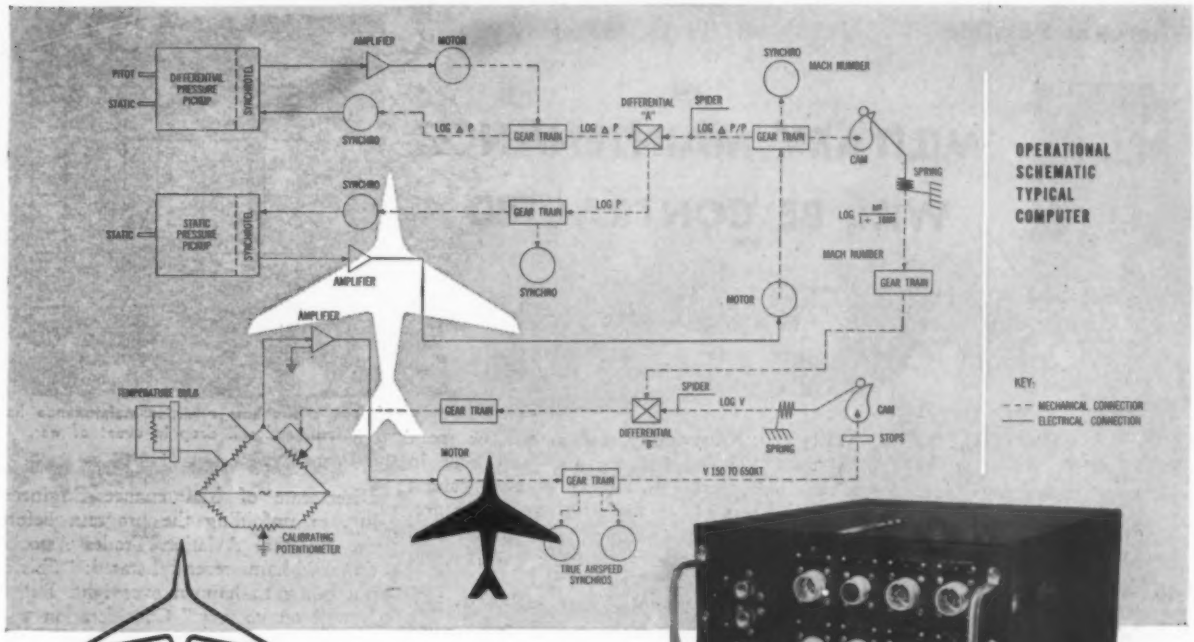
The R3Y's are powered by Allison T40-10 turbine engines turning contra-rotating Aeroproducts propellers. These, however, are to be replaced by two-stage engines which Allison has developed for better performance at altitude. First cabin pressurization for the R3Y's is 7½ pounds psi.

The R3Y-2 bow-loading version will carry a payload of approximately 44,000 pounds. This is with a stern anchor and a stern wench. Cabin is 88.3 feet as compared with 67.6 feet for the R3Y-1 and interior configuration is for 103 rearward-facing seats (or 92 litters) as against 80 seats (or 70 litters) for the R3Y-1. Seats are made by Weber Aircraft Corp. Crews are the same on both planes—two pilots, two radio operators, two flight engineers, one navigator.

A typical Marine invasion task force transportable in four R3Y-2 bow loaders is as follows:

Unit	Personnel	Weapons	Transportation
Rifle Co.	216	251 Rifles, Machine Guns, and 3 60 mm. Mortars	2 ¼-ton (4x4) Trucks with one Trailer
AT Assault Section	19	2 Rocket Launchers 2 Flame Throwers	
Demolition Team	4	Assorted Demo	
Gun Section	19	2 75 mm. Recoilless Rifles	
Det. TACP	4		
Det. H & S Co. Medical Personnel	9		

ZERO LENGTH LAUNCHER is the name of this specially constructed semi-trailer from which the Martin B-61 Matador missile is launched. Developed by Martin and ARDC, the 35,000-lb. device can operate in a 100-square-foot area. It was built by Freuhauf.



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Indicated Airspeed	Mach Number	True Temperature

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Wherever Possible . . .

Col. Dech

MILITARY MAINTENANCE WILL BE CONTRACTED

BY LOIS C. PHILMUS

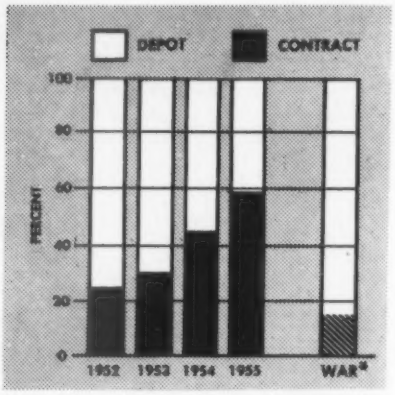

Chart shows how contract maintenance has risen, and will drop in event of war.

THE ADMINISTRATION'S POLICY to get "out of private industry" is reflected in currently-being-developed Defense Department policy to contract maintenance of military aircraft wherever possible. Result will be increased supplemental maintenance work for both large and small maintenance specialists.

The Army has announced intentions of possibly tripling its contract maintenance (AMERICAN AVIATION, Nov. 22); the Navy is going to have to "get on board" and the Air Force will spend approximately 58% of its fiscal 1955 depot maintenance funds with private industry.

The Air Force, under its its new mobilization base policy, this year achieved its division of near-equal distribution on maintenance between its depots and contractors *(see chart)* for peacetime operations. In event of war, the AF depots go from one-shift operations to full strength, while manufacturers engaged in interim maintenance return to prime production. Contract maintenance will continue for some commercial items as needed.

In the area of depot level maintenance, the Air Force has risen from spending 24.4% of the depot maintenance dollar for contracting in 1952 to 30.2% in 1953, 44.4% in 1954 and to the present 58% in 1955. Present plans call for leveling off at around 50%.

The Air Materiel Command, responsible for all depot-level maintenance plans to contract for maintenance on (1) Trainer aircraft without combat equivalent; (2) All or most of cargo aircraft; and (3) All engines below R-2800 CID except the V-1650. This is where the overhaul-base and fixed-base operator "will reap the harvest."

Prime manufacturers, although eligible to bid on the above, can also count on repair of electronic equipment. Jet engines and larger reciprocating engines will be subject to general instructions whereby contract maintenance is incidental to analytical contracts.

Nearly $260 million will be spent for maintenance by the Air Force in industry. The largest portion (about 43%) will be for aircraft maintenance, followed by engines and aircraft and engine accessories which will account for about 32%.

Field-level maintenance will continue in the hands of the individual AF commands, although the commanders have the right to contract some of the work within AMC orders and allocations. Routine periodic inspections, will be handled by AF personnel, but certain major inspections and overhauls, such as IRAN (inspect and repair as necessary), can be contracted. Policy states that field maintenance contracts will be contracted for "only when it augments existing field maintenance capabilities."

Criteria established by the Air Force in deciding whether or not to contract is contained in AFR 66-17, issued October 5, 1954. It states that the following shall be considered:

- The economy and efficiency of using contract maintenance as opposed to maintenance within the AF, considering the costs of pipeline, packaging, transportation, volume, and flow of equipment to be maintained, and possible AF investments in added tooling, manpower, training, and facilities.
- The effect it would have on continuity of support, combat effectiveness, and operational mobility of tactical units.
- The time that the equipment will be out of service undergoing contract maintenance as compared with AF maintenance.
- The qualifications of the proposed contractor in regard to his facilities tooling, available personnel, etc., in accordance with criteria established in facility capability reporting directives.
- Spare part support to or by the contractor.

Col. K. W. Dech, chief of programs development group, HQ USAF Directorate of Maintenance Engineering, in unfolding the program before the National Aviation Trades Association in Miami recently, stated: "This is not going to happen overnight. But it is well on its way." Consideration will be given to what the operator can handle, within his capacity, he added. He told the operators, that those who qualify can expect to receive work which has "counterparts in their own world."

In 1957 through 1960, Col. Dech also stated, prime manufacturers will have hit "a low flat spot" in production and equipment renewal work will be fed back to them. Overhaul bases and fixed-base operators will be picked on the basis of experience they have on various aircraft and engine equipment types.

All maintenance contracts where multiple commercial sources exist will be let by the competitive bidding process. Bid invitations are sent to interested parties which appear on an AF approval list prepared by the Air Materiel Command. An operator wishing to receive AF approval in order to receive bid invitations must apply to the Air Force AMC headquarters. An AMC team is then sent out to inspect facilities. Approval is based on the result of the inspection.

The newly-created National Aviation Maintenance Council, set-up within the framework of NATA, will go a long way toward helping to establish and maintain standards, Dech stated. Bill Lotzer, chairman of the Council, now accepting membership has made it clear that standards will be adopted and strictly enforced. The approach to the military will be on "a customer basis," he said. He also added that the operators "don't want 'boom or bust' contracts from the military. But want work doled out periodically." • • •

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TRANS WORLD AIRLINES

A REAL/Aerovias Convair 340

To compete along the densely populated coastline, eight were ordered

WHAT'S BEHIND LATIN AMERICA'S BIGGEST AIRLINE?

BY KEITH SAUNDERS

SAO PAULO, BRAZIL—There was much shaking of heads in Brazil last summer when REAL S/A Transportes Aereos bought out nearly bankrupt Aerovias Brasil. There was a feeling that REAL had overextended itself.

Today many of the same heads are shaking again, this time in wonderment at the manner in which Linneu Gomes, hard-driving president of REAL, has tackled the knotty problem of welding REAL and Aerovias into one of the largest air carriers in the Western Hemisphere.

There's a saying in Brazilian air transport circles that by 1960 or so Linneu Gomes will be either the richest or the brokest airline man in South America—and it's not easy to find any smart money that will bet on the latter alternative.

Gomes believes strongly in luck (his airline's insignia is a symbol of good fortune), but he hedges by (1) working hard, himself; (2) seeing that his subordinates do likewise; (3) keeping in constant touch with almost every detail of the company's operations, and (4) maintaining a close watch on expenses.

Gomes is a man who intends to go far, and if the distance he has come in the few short years since he started REAL is any yardstick, he'll go just about as far as he intends. A former pilot for Aerovias Brasil (when it was TACA Airways), he talked members of his family into helping him finance the purchase in 1946 of two war-surplus Douglas C-47's, and with these he founded REAL.

By emphasizing safety and performing transportation services in areas where they were badly needed, REAL steadily won new routes from the Directorate of Civil Aviation (Brazil's CAB), until today it has a route system of about 36,000 miles, most of which is unduplicated.

As the airline grew and prospered, more and more equipment was added until by 1954 it owned 32 DC-3's. It also acquired a subsidiary, Aeronorte, serving the northern part of Brazil. And it started developing an impressive administrative headquarters and maintenance base at Sao Paulo's Congonhas Airport.

About a year ago it began to appear that Aerovias Brasil, which had extensive domestic routes as well as the valuable permit to operate from Brazil to the United States was in bad straits. Gomes sensed an opportunity to make a daring but important move. He started dickering and, after one false start, finally negotiated a deal whereby REAL last June bought 87% of the stock of Aerovias. Since Gomes and relatives own all of REAL, this placed him in control of the largest airline in Latin America. Since then developments have been fast:

Linneu Gomes

Luck alone is not enough.

• **Routes**—Both companies had extensive routes, but there was not too much duplication of service. Aerovias had 21,157 miles of unduplicated route mileage, and REAL had 15,286. Of the 143 airports served by the two carriers, only 30 are common to both. However, there is much unprofitable route mileage in both systems, and REAL officials are hopeful that, with DCA cooperation, they will be able to straighten out and integrate the joint route system within another year so as to provide the greatest service at least expense. *(For corporate purposes, REAL and BIA are separate companies, but when it comes to operations they are one.)*

• **Personnel**—Just prior to the merger, REAL had 1600 employees and Aerovias had 1750. Latter included 248 flight personnel, 600 maintenance workers, and 902 in other categories. By October, Gomes had cut Aerovias' former personnel back to 1050, including 230 crew, 500 maintenance, and 320 others. This pruning of "deadwood" and excess staff cost the company more than 6 million cruzeiros *(about $125,000 at the official exchange rate)* in termination pay—called indemnizations—but the company feels it was worth it. Today the two companies have a combined personnel of about 2650 and still more cuts are to be made.

• **Equipment**—As is the case with most of the airlines in Latin America, the Douglas DC-3/C-47 is the backbone of the REAL/Aerovias fleet. After World War II, the U. S. government sold surplus planes of this type to Brazilian carriers for prices ranging from $25,000 to $40,000 each. Well suited for the capacities, airports, and average hauls in Brazil, these planes enabled the airlines to develop their traffic potential in less than 10 years to dimensions that might not otherwise have been possible in 40 years. This paved the way for U. S. domination of the Brazilian air transport market today.

REAL and BIA now operate about 55 DC-3's, but only average about 5½ hours daily utilization per plane due to the fact that most of the flying has to be done under day VFR conditions because of the absence of lighting and navigation aids at the many interior airports served. At least 95% of Brazil's airports are used only in hours of daylight.

On the international route from Buenos Aires through Sao Paulo and Rio de Janeiro to Recife, Caracas, and Miami, three DC-4's currently are used. These average about 11 hours daily utilization each, but their relatively low speed and lack of pressurization makes it difficult for BIA to compete effec-

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tively with non-Brazilian carriers who operate Douglas DC-6's and Lockheed Constellations.

There is a fare differential in BIA's favor on the international route because it is not a member of IATA and therefore can charge a lower fare than IATA member airlines. But Gomes wants to exploit this advantage to the fullest by wiping out the speed and comfort differentials now favoring its competitors. The hope is that REAL-Aerovias can arrange in the next few months to replace the DC-4's with either Super Constellations or DC-6B's, and the advantage lies with the Douglas plane because the DC-6's have the same engines—Pratt & Whitney R-2800's—as those that power the eight Convair 340's now being added to REAL's fleet.

The airline already has 45% of the tools required for overhauling this engine and is getting the remainder in the near future. This will enable REAL to overhaul all its DC-3's in the large new overhaul shop it is building at Congonhas Airport, and handle the Convair-Liners and DC-6's (if that's what it gets) in the former Aerovias hangar. The DC-4's will be sold as soon as replacements become available.

REAL's eight Convairs (three have been delivered to date) will be used primarily along the coast, where there are a number of war-built airports capable of handling this type equipment. Also, this is where they are most needed to enable REAL to compete with Cruzeiro do Saul and VARIG, which have or are getting Convair equipment for operation over some of the most densely traveled of REAL's domestic routes.

About 75% of Brazil's population is concentrated along the long coastline from Porto Alegre in the south to Recife in the north, and the bulk of the revenue traffic is flown on this route. Just about every airline in Brazil operates over at least one major segment of this coastal route. In addition, 11 non-Brazilian carriers fly from one to half a dozen schedules per week over segments of this route, virtually all of them with fifth freedom traffic rights. This makes for a keen competitive spirit in Brazilian air transportation, and it means that when one Brazilian carrier buys newer and better equipment for domestic use, its competitors have to follow suit or lose traffic. When a U. S. airline flies modern equipment into Brazil, the Brazilian flag line serving the U. S. has to try and keep pace.

• **Financing**—This is the No. 1 problem with REAL/Aerovias, as it is with every other Brazilian industry that depends upon imported equipment. The present Brazilian government's budget-balancing, austerity program holds all imports to a minimum and makes only a limited number of dollars available even to those who have ample cruzieros with which to bid for the dollars in the currency auctions. This makes it difficult for REAL to do all the things it would like to do. Its Convair 340's were financed through the Bank of America on a five-year loan. How the DC-6B's or whatever long-range transports it buys will be financed is the problem now plaguing Jorge Carnicero, the airline's vice president for the United States and senior vice president of Air Carrier Service, which is Brazilian International's U. S. representative and purchasing agent.

Linneu Gomes is confident that Carnicero will work out this problem, so he is now concentrating on the other matters connected with REAL's digestion of Aerovias: greater integration of services and equipment, consolidation of routes, etc.

Meanwhile, he is impatient to tackle even more ambitious programs abroad. He is pushing to have BIA's U. S. foreign air carrier permit amended so as to permit service to Chicago, it's now certificated only for Miami and New Orleans), and is angling for a route from Brazil to Tokyo in reciprocation for the Brazilian authorization about to be granted to Japan Air Lines.

Linneu Gomes would like to be one of the world's top figures in air transportation, and he's certainly off to a good start. • • •

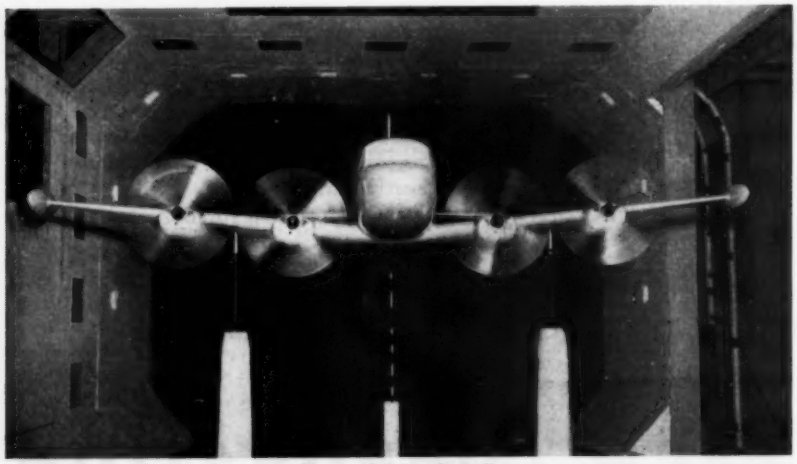
How Cessna Tests Its New 620

Cessna Aircraft Co. is completing what a company spokesman calls "a most encouraging" market survey on its proposed Model 620 executive liner. The firm has already completed more than 112 wind tunnel tests on a scale model at the University of Wichita.

Cessna expects the $35,000 investment in the wind tunnel program to result in considerable savings in constructing the first flying prototype, scheduled for early 1955.

A 6-foot-long mahogany model which weighs 250 pounds and has a span of 7 feet, 10 inches is being used in the tests. Four water-cooled 12 horsepower electric motors, housed in the nacelles, turn 13-inch propellers at 12,000 rpm.

Ailerons, rudder, flaps, and elevators are pre-set at varied flight attitudes, Nose-up, nose-down, nose-left and nose-right attitudes are controlled from a master control panel. Flight data is recorded on electronic equipment while the tunnel's 11-foot, four-bladed, variable-speed propeller and the airplane model's four props simulate winds up to 200 mph.



The model "in flight."
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Now the Stratocruiser's high performance is being further stepped up. Installation by Pan American of new turbosuperchargers, new propellers and extra fuel tanks will permit daily flights to Europe *of their new Super Stratocruiser* on nonstop schedules.

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HELICOPTER RAMJET HIDES IN THE ROTOR BLADE

• Gives boost power with little penalty

BY WALTER A. KILRAIN

ALMOST INVISIBLE ramjet engines may be one answer to the problem of how to boost helicopter performance during take-off without suffering prohibitive losses while cruising.

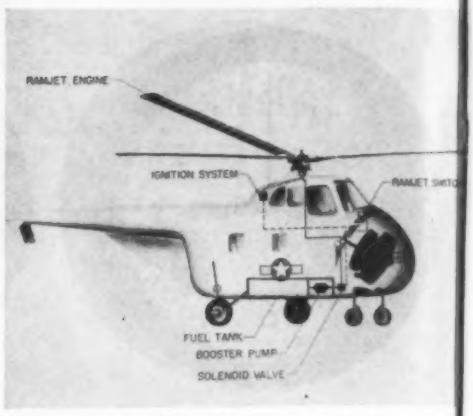
Helicopter payloads have been held down by the fact that rotorcraft require about twice as much power for take-off or hovering as they do for cruising. Use of a secondary power system, to operate only during critical periods, is the solution only if the added weight and drag are kept low enough. Watermelon-shaped ramjet engines mounted on rotor tips have fallen down on this score since their drag while shut off is equal to their thrust while running.

Marquardt Aircraft Co., of Van Nuys, Calif., is now developing a ramjet built in the shape of the rotor blade, which will simply replace the last 15 inches of the blade at the tip. Like the blade with which it is designed to operate, the experimental engine is 16½ inches long and only 2½ inches thick. Its 40-pound thrust is gained at the cost of only three pounds more drag than would be produced by the section of normal blade. Additional weight is only four to five pounds.

Air enters the leading edge of the airfoil-shaped engine when a shutter is retracted into the blade. The air passes a flameholder and fuel nozzle, then exits through a slot in the trailing edge. The size of this exit slot varies with the internal pressure of the engine.

When the engine is shut down for cruising, the shutter slides back into place over the opening in the leading edge. The exit slot is then pulled closed by the centrifugal motion of the blade tip.

The rib which forms this tip is hinged, and as it pivots outward under centrifugal force it pulls the top and bottom surfaces of the exit slot together. When the engine is burning, internal pressure holds the rib in place and prevents this.



Integral parts of the boost system are shown in this cutaway drawing.

The power requirement of the boost system is linked to the primary system cruise power setting. If the primary system, say a piston engine, is to cruise at 70% of rated power, then the boost system should be designed to provide 30%.

An increase of only 30% in rotor horsepower may be enough to increase gross weight by 20% and this, in turn, may mean a 100% increase in the payload, if the weight penalty is small enough.

What might the weight penalty be with ramjets providing the increase in horsepower? Here's an illustration:

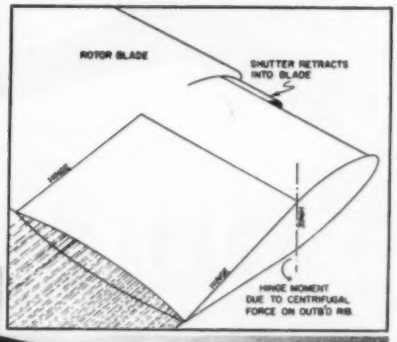
The problem is to provide a boost system for a 6400-pound helicopter equipped with a 550-bhp engine. To double the payload at standard sea level conditions it is desired to increase gross weight by 1500 pounds. This can be done by adding 150 rotor hp. If a three-bladed rotor is to be operated at 690 feet per second at take-off, each tip-mounted engine will be required to provide 40 pounds of net thrust.

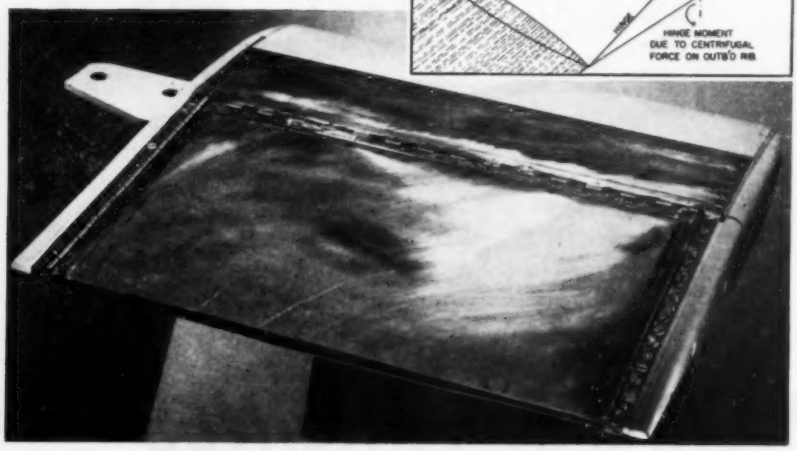
The various penalties that would be paid in terms of engine and fuel weight for the types involved have been approximated by R. T. DeVault of Marquardt:

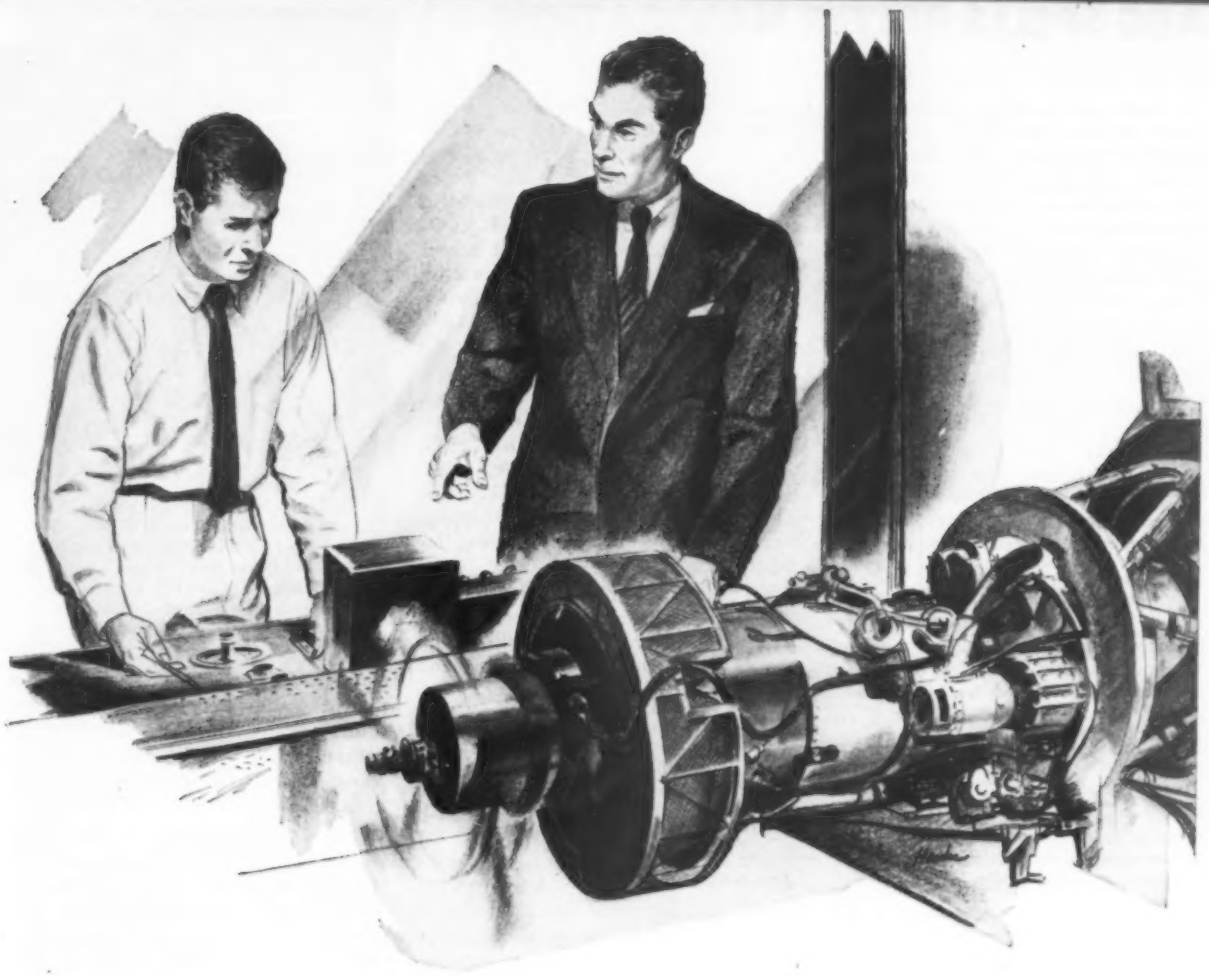
WEIGHT PENALTY INCURRED BY ADDITION OF 150 ROTOR HP

Type of Power Boost	Initial Wt. (Lbs.)	Fuel Rate (Lbs./ Min.)	Total Wt. At 10 Mins., (Lbs.)
Piston	540	1.4	554
Turbine	440	2.0	460
Augmented turbine (Water-alcohol injection)	344	12	464
Rocket	70	50	570
Ramjet	45	22	265

Flameholder and fuel nozzle of the ramjet can be seen in photo at top (with cover removed). Drawing and photo below show how hinged action allows thrust exit.







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First public demonstration of the Aural Bearing Generator, a low-cost system of navigation for military, commercial, and private aircraft, was held recently at Dover Air Force base. Flight demonstrations of the system were staged by Union Switch & Signal, a division of Westinghouse Air Brake Co., which is the company prepared to produce and market the system.

Present for the demonstration, handled with two private twin-engine aircraft, were representatives of CAA, the U. S. Air Force, Navy, Air Navigation Development Board, and other interested groups. The planes were equipped with earphones throughout the cabin so that the industry members could monitor the aural signal of the system.

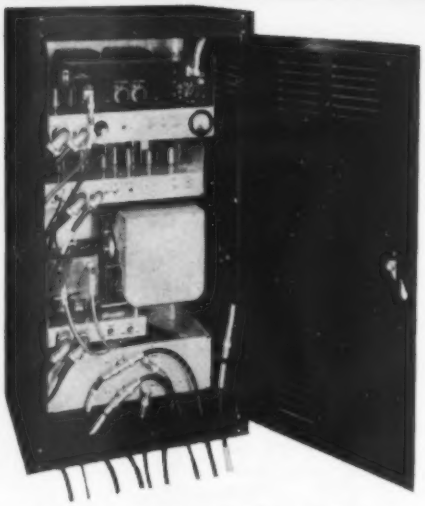
The Aural Bearing Generator system is an outgrowth of the Gross Error Checker originally designed by Vernon Weihe of the Air Transport Association and further developed by Melpar, Inc., another division of Westinghouse Air Brake Co. It was designed to give the pilot an aural means of checking the visual signal of the VHF omni-range in the cockpit. This gave the pilot assurance that the complex airborne receiver equipment was functioning properly by providing a simple cross-check.

One of its chief advantages is that it requires no airborne components beyond a conventional VHF communications receiver. The ABG uses the voice channel of the VOR to transmit a voice signal which identifies the azimuth of the receiving aircraft from the omni-range station. This information duplicates the data presented on the instrument dials of the conventional VOR. The accuracy of the voice signal is well within five degrees and with practice the pilot should be able to interplolate heading indications within a few degrees.

Early testing established that pilots of private planes or other aircraft not equipped with VOR receivers, but having VHF communications gear, could use the ABG signal for routine navigation instead of as a cross-check. Since it required no additional airborne equipment it was particularly promising for this type application.

The only equipment involved is the generator, a small cabinet-mounted transmitter attached to the VOR ground station. It contains a power supply and side-band generator, a monitor, magnetic drum chassis, and radio frequency bridge.

The signal transmitted by the ABG consists of azimuth readings read at 10 degree azimuth intervals and automatically transmitted via the VOR antenna. A rotating figure eight pattern transmitted simultaneously by the system masks the aural signal except in the narrow band area formed between the lobes of the figure eight. An aircraft flying to or from the station equipped with the ABG can only hear the clear, unmasked aural signal on the azimuth corresponding to the plane's position relative to the station. Thus a plane due east of the station will only hear the word "ninety" clear spoken.



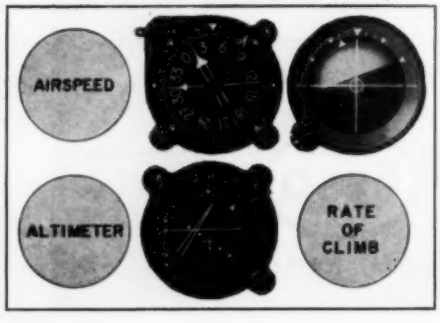
Interior detail of the Aural Bearing Generator shows simplicity of equipment. Single cabinet is 42 inches high, 21 inches wide, and 16½ inches deep. Signals can be transmitted through VOR antenna or unit can be self-contained.

Weihe has developed a simple item of airborne equipment which will automatically cut out all but the unmasked voice signal, thus eliminating the need for the pilot to monitor signals which are of no value to him. This equipment weighs under one pound.

SPERRY'S NEW INSTRUMENT SYSTEM

Pan American World Airways has ordered Sperry's Integrated Instrument System for installation in its recently ordered fleet of Douglas DC-7C's. The system, introduced by Sperry Gyroscope Company to reduce the pilot's operational task in high-speed aircraft, contains three basic instruments. These instruments fit into the standard instrument arrangement so that considerably more information is provided in a more simple manner and without additional units.

Integrated Flight System substitutes three newly developed Sperry instruments within the standard instrument panel. Shown are the C-6 Gyrosyn compass (upper center), horizon flight director (upper right) and the pictorial deviation indicator (lower center).



The Sperry Integrated Instrument System consists of a HZ-1 horizon flight director, direction indicator, and R-1 radio deviation indicator. Each of the instruments is redesigned to combine functions while improving the type of display:

• Horizon Flight Director—combines the improved Sperry flight director (Zero Reader) providing signals telling the pilot to "fly right or left, up or down" in order to maintain any desired flight path, with a "bar-less" horizon providing pitch and roll attitude.

• Model C-6 Gyrosyn Compass—provides improved radio cross-bearing data directly on the Gyrosyn Compass master dial. Settable course marker on the compass improves presentation while also serving as heading selector for the flight director.

• Pictorial Deviation Indicator—Displays radio beams as V-shaped bar showing relative position of ground transmitter; incorporates omni-bearing selector and establishes ILS glide path and localizer deviation.

Developing a new gas turbine engine requires painstaking tests

Solar's research and development program assists all production

RESEARCH AND DEVELOPMENT at Solar are an integral part of every production job. Every product, whether it is a prototype or one that has been in standard production for years, benefits from Solar's continuous research program. Processes, methods, tooling, as well as product designs, are continually and systematically examined by Solar engineers.

Powder metallurgy research

Integrated study programs at Solar have ranged from pioneer afterburner research and the development of small gas turbines to the volume production of small aircraft bellows. These Solar projects have assisted many companies to improve their products in important ways as well as to reduce costs substantially.

Solar's continuous research program benefits every Solar customer. Whether you order a special experimental unit or quantity production of a standard part, you are assured of the most advanced design and fabricating skills.

SOLAR AIRCRAFT COMPANY — SAN DIEGO, DES MOINES

Circle No. 77 on Reader Service Card.

This is What Solar Offers You

Solar specializes in the manufacture of precision products from alloys and special metals for severe service. Solar's experience since 1927 is unduplicated in this field. Solar skills and facilities range from research, design and development through to mass production. Wherever heat, corrosion or difficult specifications are problems, Solar can help you solve them.

PLANTS. *In San Diego and Des Moines (photograph above). A total of 1,400,000 sq ft of floor space. Approximately 5,000 employees. Annual sales over $65,000,000.*

EQUIPMENT. *Production equipment for all types of metal fabrication —forming, machining, welding, brazing, casting, coating. Extensive laboratory and testing equipment. Facilities for development, prototype, limited or mass production.*

SERVICES. *Research, design, development, tooling and production engineering staffs. Experienced with all alloy steels, stainless alloys, super alloys, and titanium and its alloys. Government source inspection and Solar quality control meet rigid aircraft and commercial standards.*

CONTRACT PRODUCTION

Current orders include aircraft engine and airframe parts, alloy castings, pneumatic ducting, atomic energy components. Customers include some of the most honored names among aircraft and industrial companies in the U.S. and Europe.

SPECIAL PRODUCTS

Bellows. *"Sola-Flex"® bellows and expansion joints in many designs from ½ in. up to the world's largest, 28 ft in diameter.*

Gas Turbines. *Solar "Mars" 50 hp engines for auxiliary generator sets, ground carts, portable fire pumps; Solar "Jupiter" 500 hp engines in variable and constant speed models.*

Ceramic Coatings. *"Solaramic"® is the Solar trade mark for a family of coatings that protects metals from heat, corrosion, galling and abrasion.*

Controls. *Complete control systems utilizing the new Solar "Microjet"® principle for control of gas turbines, jet engines and pneumatic devices.*

FURTHER INFORMATION
Your inquiry regarding any Solar service or facility will receive prompt attention. Address Solar Aircraft Company, Department A-49 San Diego 12, California.

Above is Capital's "cooperative kit," sample brochures, and advertisements.

CAPITAL SELLS A "NEW CONCEPT"

BY ERIC BRAMLEY

LAST MAY, before Capital Airlines had formally signed its order to purchase Vickers Viscounts, James W. Austin, vice president-traffic and sales, sent word to his district sales managers: "I want the names and home addresses of the people you consider to be the most important and influential in your communities." The number of names requested varied according to the size of the city.

On Oct. 11, all people on these lists received an attractive brochure (250,000 have been used) entitled "A New Concept in Flight—Capital Airlines Viscount, powered by Rolls-Royce." There was a short covering letter signed by J. H. Carmichael, president.

Thus started what promises to be one of the most intensive airline advertising and promotion programs ever undertaken to introduce a new airplane. Although actual cost hasn't been revealed, it's described as a multi-million dollar effort.

The fact that Jim Austin, one of the industry's most promotion-minded executives, started his program even before the Viscount order was formally signed (announcement was made June 3) is indicative of the fact that he realized the big job ahead: (1) Introducing to the U. S. public the first foreign-built airplane to enter airline service in this country in over two decades; (2) Introducing a new type of power—turboprop.

After a preview of the campaign it becomes apparent that there will be few people along Capital's system who will not know: (1) What a Viscount is; (2) How it is powered; (3) What it has to offer in speed and comfort. The campaign is well-conceived.

Its "single basic element," as Austin calls it, is a medallion (see p. 58) stressing the airline's name, the name of the airplane, and the fact that it is powered by Rolls-Royce. This medallion will appear in all advertisements, brochures, posters, etc.

Some of the selling points that will be repeatedly emphasized:

- **A new concept in flight.**
- **Rolls-Royce power.** *("You're never allowed to forget you're riding with Rolls-Royce engines," says Austin. The inboard side of the engine nacelles will carry Rolls-Royce emblems, visible to the passengers. The medallion will be on the door to the pilot's compartment, with a smaller decal on the rear cabin door.)*
- **The fact that the Viscount has four engines.**
- **"Swift, smooth, silent, sure** *(Note use of the word "sure" as being a better seller than "safe".)*
- **Passenger comfort:** "Quiet elegance" . . . "Transforms air travel into something more than a race against time" . . . "Largest windows on any commercial airliner" . . . "The widest cabin you have ever seen" . . . Two-abreast seating . . . Absence of vibration . . .

Austin

Anderson

A big job ahead

The advertising and promotion program is divided into two parts that will overlap somewhat; a pre-seat selling phase, and a seat-selling phase. The former is already underway.

This campaign is divided into four parts. The first was of a "general" nature, introducing the airplane. It was kicked off by the brochure, followed by the first ad, plus posters, etc.

In contrast to the "general" theme of the first phase, the second part (now in progress) concentrates on the engine. This is featured in the second ad, second brochure, more posters, and other material.

In addition, Capital has on display a life-size cutaway model of the Rolls-Royce Dart. It's been shown at such places as Washington National Airport, Dayton Air Show, Chicago's Merchandise Mart, hotels, department stores. Already 1,158,044 people have seen it. And in the near future the engine will be loaded into a 45-foot truck-trailer and the show will be put on the road to a large number of cities. "If we're traveling between cities and we see a college campus, perhaps we'll pull in and invite the students to have a look," Austin explains. The trailer will also carry small models of other famous Vickers/Rolls-Royce planes: the Vimy (first non-stop Atlantic flight, 1919), Spitfire, etc.

Phase 3 of the program will feature passenger comfort. This will start shortly after the first of the year and with another ad, brochure, etc.

Phase 4 (April) will be what is described as a "wrap-up" of everything that has gone before.

This part of the pre-seat selling program is not designed to reach a mass audience; rather it is aimed at people who have a direct influence on public opinion and on the choice of air transportation. The ads are appearing in aviation magazines (American Aviation, *Aviation Week*), travel publications *(Travel Items, Travel Trade, ASTA Travel News, Travel Agent)*, advertising, sales, and press publications *(Printers Ink, Editor & Publisher, Sales Management, Advertising Age, Southern Advertising, and Publishing)*, commerce magazines *(Baltimore, Buffalo Business, Clevelander, Detroiter, Greater Minneapolis, New Orleans Port Record, Greater Philadelphia, Greater Pittsburgh, Rochester, Washington Board of Trade News)*, and financial papers *(Wall Street Journal and Forbes)*.

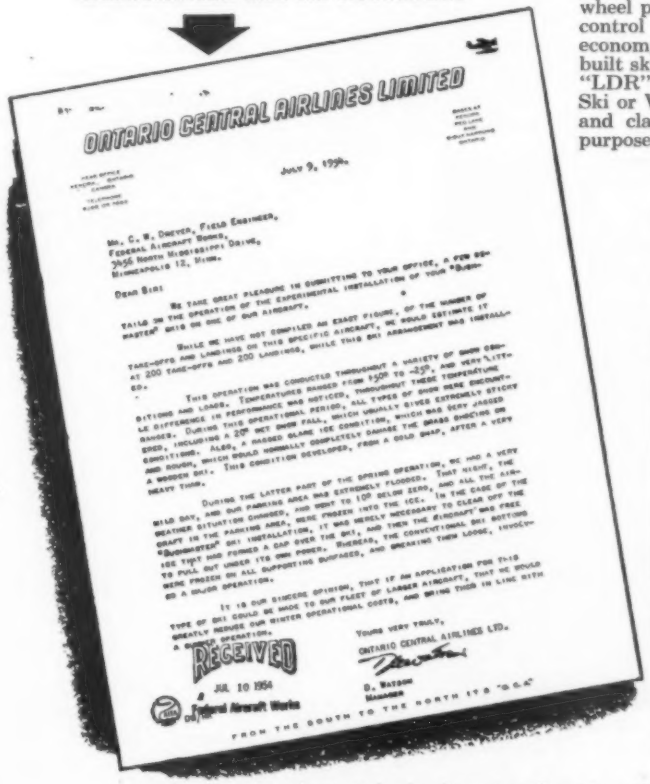
Between phases 3 and 4, another element is introduced—national maga-

NEW FEDERAL "LDR" SKI BOTTOMS

insure normal take-off performance under every snow condition

Enjoy the Convenience of Fixed Base Facilities with the Utility for Reaching the Most Remote Areas with Federal Combination Wheel-Skis.

PERFORMANCE PROVED BY CANADIAN BUSH OPERATORS... READ WHAT ONE OPERATOR SAYS



ONTARIO CENTRAL AIRLINES LIMITED

July 9, 1954.

Mr. C. W. Dreyer, Field Engineer,
Federal Aircraft Works,
3456 North Mississippi Drive,
Minneapolis 12, Minn.

Dear Sir:

Re take great pleasure in submitting to your office, a few re-
TAILS ON THE OPERATION OF THE EXPERIMENTAL INSTALLATION OF YOUR "Super-
MASTER" SKIS ON ONE OF OUR AIRCRAFT.

TAKE-OFFS AND LANDINGS ON THIS SPECIFIC AIRCRAFT, WE WOULD ESTIMATE IT
AT 200 TAKE-OFFS AND 200 LANDINGS, WHILE THIS SKI ARRANGEMENT WAS INSTALL-
ED.

DITIONS AND LOADS.

LE DIFFERENCE IN PERFORMANCE WAS NOTICED, THROUGHOUT THESE TEMPERATURE
RANGES. DURING THIS OPERATIONAL PERIOD, ALL TYPES OF SNOW CONDITION-
ERED, INCLUDING A 20" DEEP SNOW FALL, WHICH USUALLY GIVES EXTREMELY STICKY
CONDITIONS. ALSO, A PACKED GLARE ICE CONDITION, WHICH WAS VERY ABRADED
AND ROUGH, WHICH WOULD NORMALLY COMPLETELY DAMAGE THE SKIDS SHOEING ON
A WOODEN SKI. THIS CONDITION DEVELOPED, FROM A COLD SNAP, AFTER A VERY
HEAVY THAW.

DURING THE LATTER PART OF THE SPRING OPERATION, WE HAD A VERY
MILD DAY, AND OUR PARKING AREA WAS EXTREMELY FLOODED. THAT NIGHT, THE
WEATHER SITUATION CHANGED, AND WENT TO 10° BELOW ZERO, AND ALL THE ASH-
CRAFT IN THE PARKING AREA, IT WAS MERELY NECESSARY TO CLEAR OFF THE
"Super-MASTER" SKI INSTALLATION, AND THEN THE AIRCRAFT WAS FREE
TO TAXI AND FORMED A GAP OVER THE SKI, AND THEN THE CONVENTIONAL SKI BOTTOMS
TO PULL OUT UNDER ITS OWN POWER. WHEREAS, THE CONVENTIONAL SKI BOTTOMS
WERE FROZEN ON ALL SUPPORTING SURFACES, AND BREAKING THEM LOOSE, INVOLV-
ED A LONG OPERATION.

IT IS OUR SINCERE OPINION, THAT IF AN APPLICATION FOR THIS
TYPE OF SKI COULD BE MADE TO OUR FLEET OF LARGER AIRCRAFT, THAT WE WOULD
GREATLY REDUCE OUR WINTER OPERATIONAL COSTS, AND BRING THEM IN LINE WITH
A SUMMER OPERATION.

RECEIVED
JUL 10 1954
Federal Aircraft Works

Yours very truly,
ONTARIO CENTRAL AIRLINES LTD.
D. Watson
Manager

FROM THE SOUTH TO THE NORTH IT'S "O.C.A."

Federal skis with new high performance "LDR" bottoms provide uniform snow operations normally associated with wheel performance. Federal Wheel-Skis with pilot selective control give greater utilization, safety, convenience and economy. Now the world's most dependable and ruggedly built ski has even better performance with the new Federal "LDR" ski bottom. There is a Federal Combination Wheel-Ski or Wheel-Replacement Ski model for nearly every type and class of aircraft. Federal Wheel-Skis provide multi-purpose landing gear.

NEW FEDERAL "LDR" SKI BOTTOMS HAVE A PROVEN RECORD OF PERFORMANCE

The most adverse flight conditions encountered are those which challenge Canadian and far north bush operators. Federal "Alcan-Bushmaster" skis with "LDR" bottoms have been proven to have outstanding free sliding take-off and landing characteristics. Under the severe conditions of "sticky snow," "frosty snow," "sand snow" and "slush," "LDR" eliminates "freeze down" and "sticking."

ATTENTION! FEDERAL SKI OWNERS!

Federal "LDR" ski bottom surfaces can be readily installed on your present skis. Modernize with a Federal pre-formed "LDR" Bottom Conversion Kit. Enjoy unexcelled ski performance with greater efficiency, less maintenance and increased economy.

Your nearest Federal distributor will give you complete information about this newest development in aircraft skis. Contact him or write Federal Aircraft for the name of your nearest supplier.

FEDERAL
AIRCRAFT WORKS

3456 No. Mississippi Drive • Minneapolis, Minn.

Distributed in the U. S. by leading aircraft parts and supplies distributors from coast to coast

zine advertising. During the January-April period, Capital will run two full-page and two two-column ads in *Time, Newsweek,* and *Business Week*. Although part of the pre-seat selling plan, they will not be as technical as those running in business publications. The big national magazine campaign *(with lots of "sell")* won't start until the fall of 1955.

Austin has also contacted about 70 U.S. firms which are supplying products used in the Viscount, inviting them to participate in a tie-in advertising campaign. Upon receiving an expression of interest, Capital's sales manager in the firm's home city calls with a complete "cooperative kit" containing art work, copy, photos, radio and television scripts, etc. A substantial number of firms are likely to participate.

In the latter part of February, a billboard program will open. Capital is buying billboards *(the largest will be 80 feet long)* near every major city on its system. They will show a large model of a Viscount, extending above the top of the board, with cabin lights and flashing wing lights for night display.

About a month before Viscount service is to start *(presently scheduled for some time in April)*, the seat-selling program opens. This consists principally of newspaper ads in all Capital cities, with space varying from 1200 lines to 450 to 249. Specific merchandising—cities to be served, flying times—will be featured. Television and radio spots will also be used.

On top of all these programs, each

Symbol of a happy combination

division of Capital's sales department has its own "educational" plan. V. K. Stephens, interline and agency manager, will see that travel agents are informed. Willson Offutt, interline relations manager, will keep other airlines up-to-date. Bill Urquhart, group and convention sales manager, will spread the word among charter customers *(particularly athletic coaches)*.

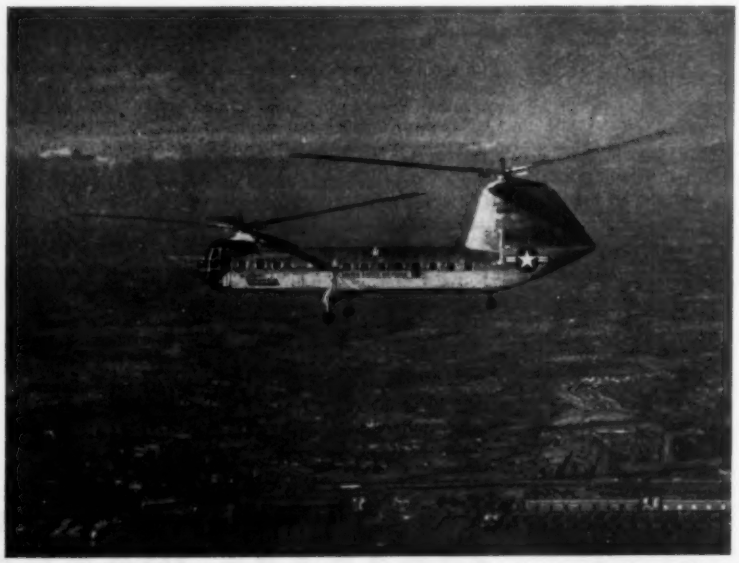
Further pyramiding the sales effort will be:

- A 25-minute 16-mm color-sound movie, "A New Concept in Flight," filmed by John Prihode, Capital's photographer.
- Viscount models, in all sizes, for displays *(there will be a number of three-dimensional window displays)* and trade shows.
- A Viscount coin *(about the size of a quarter)* will be produced and given to the first few thousand passengers *("You can stand a coin on edge in a Viscount")*.
- Pocket calendars, playing cards, postcards, baggage stickers, coat tags, air mail stickers, book matches, timetables (starting in March), ticket envelopes, a Pitney-Bowes mail meter slug, a Viscount mail stuffer for banks to send out with monthly statements.

For internal company use, Capital has produced a pocket-sized booklet, *Talk About the Viscount,* which has been sent to all 4500 employees to enable them to answer policy questions about the Viscount—i.e., Why was a foreign airplane purchased? There will be an employees' book on the airplane's advantages. In all company offices there is a Viscount bulletin board, describing a different feature of the Viscount each month. All mailing pieces are sent first to the homes of employees. Small cardboard signs have been distributed systemwide stating, *"Say: Vi-count. The 'S' is silent."*

Vickers and Vickers-Armstrongs will assist Capital financially with airplane models, billboards, and anything else that specifically sells the Viscount name. In addition, these companies will have their own campaigns in the U.S. Rolls-Royce will assist financially, and will stress the Rolls-Royce name in its own campaign.

Austin's chief aides on the overall program are John Andersen, sales promotion manager; Joel Daniels, advertising manager; Joe Montgomery, advertising art director, and his assistant, Charles Behrens. Ad agency is Lewis Edwin Ryan, Washington. For Vickers Ltd. *(McCann-Erickson agency)* plans are being handled by Jack Vosper, manager of the public relations and advertising department. Charles Gardner, assistant to the managing director of Vickers-Armstrongs, and A. I. Fenwick, Rolls-Royce press officer, are representing their respective companies. • • •



EARLY THIS MONTH Piasecki Helicopter Corp. revealed that its Air Force YH-16 troop/cargo transport helicopter flew to an altitude of 3000-4000 feet and at speeds exceeding 130 mph for the first time.

ON THE COVER

A. P. Fontaine (right), recently appointed director of engineering for Bendix Aviation, explains the new polar path compass system to Bjarne Johnsen, navigator of Scandinavian Airlines System. Bendix system was used on first commercial flight over polar regions between the U. S. and Europe. Fontaine heads an engineering program which last year spent $70 million and employed a staff of 7000.

An engineering graduate of New York University. Fontaine was associated with Fairchild, Republic, Stinson, and Convair before joining Bendix in 1944.

From 1946 to 1951 he established and directed the Aeronautical Research Center of the University of Michigan. He rejoined Bendix in 1952.

Circle No. 79 on Reader Service Card. ——→

Freedom's Team

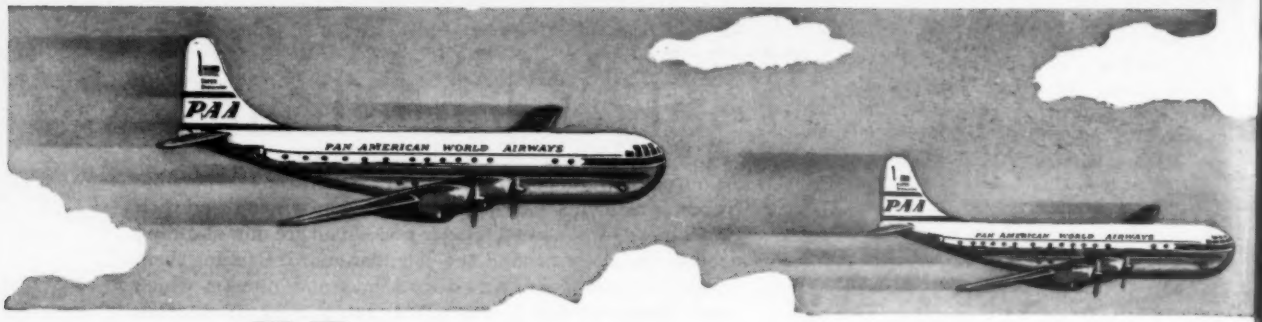
At outposts of freedom near the Arctic Circle–made possible by our agreements with other governments which stand with us against aggression – U.S. Air Force men are now standing around-the-clock, around-the-calendar guard. Backing them up are the resources of American science and industry which have produced the Northrop Scorpion F-89 all-weather interceptor. The F-89 is America's heaviest-armed fighter. Wing-tip "hornet's nests" which carry 104 rocket projectiles are coupled with the latest electronics to make the F-89 a deadly aerial destroyer, capable of striking a bomber 45,000 feet and more above the earth. These jet home defenders are one of many modern weapons created by the engineering and production complex of Northrop Aircraft, Inc., since 1939 America's first company in the vital design, development and production of all-weather and pilotless aircraft.

NORTHROP

NORTHROP AIRCRAFT, INC. • HAWTHORNE, CALIFORNIA

Pioneer Builders of All Weather and Pilotless Aircraft

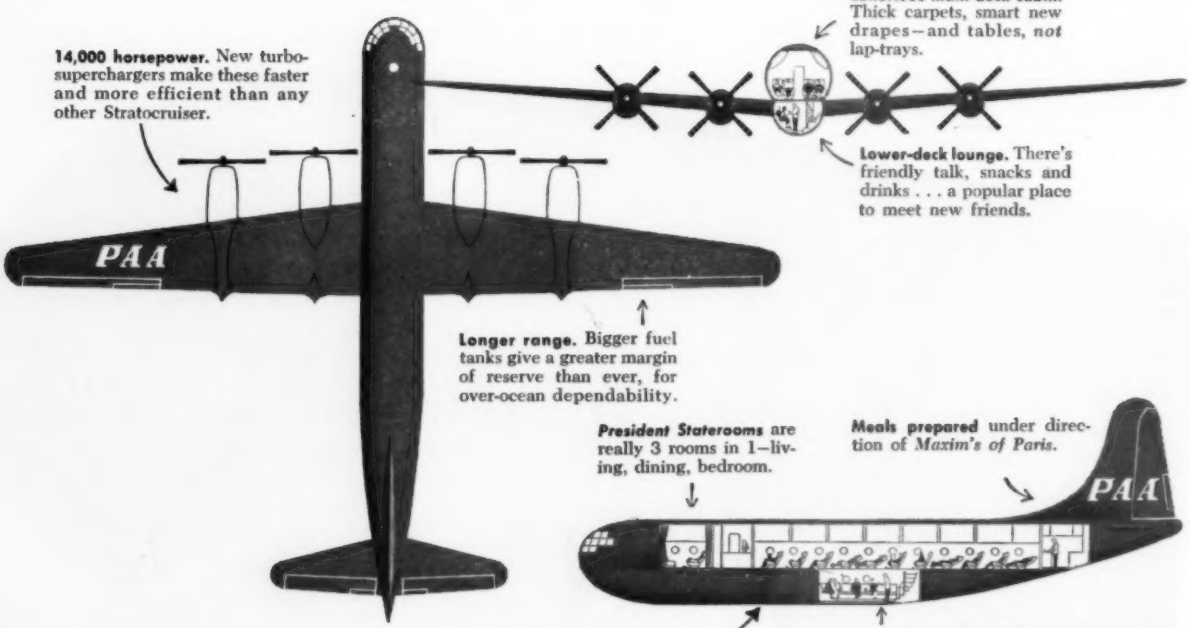
8-A-25



Now... super-powered SUPER

NON STOP to PARIS or

World's quietest, most powerful,



14,000 horsepower. New turbo-superchargers make these faster and more efficient than any other Stratocruiser.

Luxurious main-deck cabin. Thick carpets, smart new drapes—and tables, *not* lap-trays.

Lower-deck lounge. There's friendly talk, snacks and drinks . . . a popular place to meet new friends.

Longer range. Bigger fuel tanks give a greater margin of reserve than ever, for over-ocean dependability.

President Staterooms are really 3 rooms in 1—living, dining, bedroom.

Meals prepared under direction of *Maxim's of Paris.*

Everybody sleeps in a Sleeperette service easy chair or in a berth that's bigger than on a train!

Super Stratocruisers offer "downstairs" service. There's room to walk around on these giant airliners! Come down the circular staircase anytime to the lower-deck lounge for extra relaxation.

The Super Stratocruisers are exclusive with

PAN AMERICAN

World's Most

STRATOCRUISERS

LONDON AT NO EXTRA COST

most comfortable, over-ocean airliners

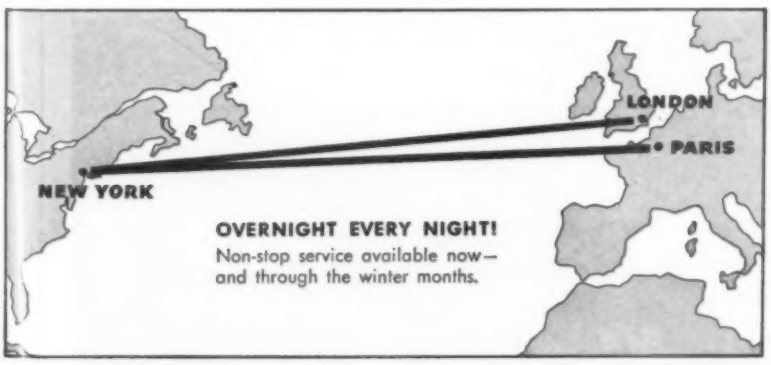
Nightly to LONDON! Five a week to PARIS!

● By December 15, Pan American's new fleet of *Super* Stratocruisers will be flying *daily* to Europe on regular NON-STOP schedules.

These great airliners are superpowered. Each is equipped with 4 new turbo-superchargers—new propellers—more fuel capacity for increased over-ocean dependability.

This means you can now enjoy quiet, restful sleep as you fly on, high above the weather, to PARIS OR LONDON. You'll land refreshed, ready for work or fun, in the morning . . . because you will have crossed the Atlantic NON-STOP!

An all-sleeper service. Stretch out your feet as far as you can—yours can't touch the seat in front! Yours reclines to *bed-length!* That's Sleeperette* service . . . another Pan Am exclusive. If you choose, reserve a berth—foam-soft—at slight extra cost.



Superb "President" service. Cocktails, or your favorite refreshment, appear tinkling at your elbow. With hors d'oeuvres, of course. Then, somehow, you sense Paris is near. Meals prepared by renowned *Maxim's of Paris* are being served! Whether it's *Breast of Chicken Veronique—Filet Mignon Rossini*—or some other specialty—*Maxim's* gives it a unique touch of excitement and romance.

Staterooms available. Want to be alone? You can be, with your wife or business companion, in the seclusion of a *President Stateroom*, designed by Dreyfuss. Lounge chairs, both upper and lower berths—retire when it suits you best—generous shelf and closet space, private wash basin, private bar, special service. Just $125 extra for double occupancy.

Choice of service. Ten flights each week are by regular, first-class *President* service . . . two a week are by the famous *President Special*, a deluxe, extra-fare flight. You may use the popular Pan Am "Pay-Later" Plan to finance your trip, if you wish.

FIRST ON THE ATLANTIC . . . THE PACIFIC . . . IN LATIN AMERICA . . . 'ROUND THE WORLD

Experienced Airline

*Trade-Mark, Reg. U. S. Pat. Off.

Airline Commentary

By Eric Bramley

FOR THE FIRST TIME, airlines are about to start fining each other for failure to deliver interline baggage. It's part of the "new deal" in baggage handling at Chicago's Midway Airport, on which the airlines have been working for months. All but two carriers have agreed to participate in a plan under which interline baggage transfers will be handled by Allied Aviation Service Co. At present writing, the plan will proceed, probably next month, without these two —one major trunk and one local service line—which are dissatisfied with the formula for allocating costs. But the penalty will apply to everyone. If Airline A brings a passenger into Chicago for connection with Airline B, and fails to transfer his bag, Airline B collects a fine (probably $3 to $5). Under present rules, Airline B must stand the expense (up to $5) of getting lost or delayed bags to customers, and the penalty will at least partially reimburse it. Big advantage, though, is that the new system will keep baggage handlers on their toes. At even $3 a bag, the monthly bill can be substantial.

* *

Sincere congratulations of this department to Frank Macklin on his election as executive secretary of the Air Traffic Conference. Frank, who did a bang-up job as head of ATA's military bureau, has been in air transportation for 24 years (starting as a district traffic agent for Continental Airways). We wish him well.

* *

Interesting development has been the formation of a committee composed of interline representatives of the airlines. It's already held three meetings and from the look we had at the last agenda, worthwhile results should be forthcoming on a number of problems. Unusual is the fact that the committee is not part of the Air Traffic Conference—the interline boys just decided to form their own group. The industry has often been criticized for having too many committees, but we think this one can serve a real purpose.

* *

Around the industry: We've been briefed on details of a contest (the 25-words-or-less variety) that TWA will conduct next year. Really has some new twists, and the prizes are big. Watch for details.

Traffic, Sales, Promotion

Pan American, Eastern and National have worked out a deal to swap planes for peak seasons. PAA will lease two aircraft each from NAL and EAL for summer use, and in return will lease two planes to each carrier for winter. NAL and EAL get their planes this month. . . .

National Airlines in January will start its first in-season winter package vacation program to Florida. January price (not including meals) will be $39-and-up for six days and seven nights at Miami Beach ocean-front hotels. February-March price starts at $57. . . .

Northeast Airlines starts special flights this month between New York, Lebanon, N. H., and Stowe, Vt., for skiing enthusiasts. Trips leave Friday evenings, return before midnight Sundays. A special "ski stewardess" (in ski costume) will be aboard . . . **North Central Airlines** also has a sales promotion program in progress aimed at skiers. . . .

Northwest Airlines and Eastern Air Lines open one-plane service between Twin Cities and Miami on Dec. 15. Under the equipment interchange there will be one round-trip Stratocruiser flight daily . . . **United Air Lines** last month carried its 30,000,000th passenger . . . **Trans-Texas** hauled its 500,000th. . . .

British Overseas Airways and British European Airways now have an installment plan available for United Kingdom residents . . . Over quarter of a million copies of **Pan American's** "New Horizons" travel guide have been sold ($1 a copy).

Airport ground transportation companies can't discriminate in fares to compensate for variation in traffic volumes, according to a ruling by the **California Public Utilities Commission.** Ruling was on an application of **AirporTransit** of Los Angeles to reestablish service to the Ambassador Hotel (discontinued because of light loads) at a 40c higher fare than in effect to the Biltmore, Statler, or Hollywood-Roosevelt. PUC authorized reinstatement but at the standard $1.20 fare . . . **Air Transport Association's** airport passenger terminal committee will act as liaison between airlines and ground transportation firms for the purpose of improving service.

Agency Resolution Killed

The controversial resolution that would have limited travel agents to a maximum commission of $1.50 on domestic one-way sales and $3 on round-trips, instead of the present 5%, was killed by the Air Traffic Conference at its New York meeting last month.

The ATC action came as no surprise. Since its adoption a year and a half ago, the resolution has been bitterly opposed by the American Society of Travel Agents, which took its case to the Civil Aeronautics Board and thus prevented the measure from becoming effective. And in recent months, an increasing number of airlines have favored dropping the resolution. It's probable that a joint airline-agents committee will be set up to maintain a continuing study of the agency program.

ATC made no changes in the reconfirmation and coach no-show penalty rules. TWA favored dropping the coach penalty, while American Airlines proposed elimination of reconfirmation and adoption of a no-show charge for first-class as well as coach. No agreement could be reached on either plan.

National Airlines decided not to press for a discussion of its "reservations charge" plan *(Airline Commentary, Nov. 8)*. CAB had okayed such discussion, but its order was so worded as to prohibit any mention of possible fare changes that might result from the plan. NAL will seek broader authority from CAB before bringing the matter up again.

MINIATURE OVERNIGHT BAGS for children have been added by Pan American World Airways. Idea originated in PAA's Copenhagen office. (Photo shows, l—r, baby bag, children's size, and regular). Natco Products Corp. will merchandise them in U. S. through chain store groups. Approximate cost: 69c for baby size, $1 for children's.

The Eland, one of the most powerful of the South African antelopes, moves off at high speed when danger threatens.

adding speed smoothly

The Napier Eland is a propeller-turbine aero-engine for use with a single-rotation propeller. It has been designed and developed by a firm with a long list of outstanding engines to their credit — and it shows its pedigree in many ways: excellent compressor characteristics, for instance. These give the Eland really smooth rapid surge-free acceleration.

CHECK THESE OTHER IMPORTANT ELAND FEATURES!

- High aerodynamic efficiency — 3,000 e.h.p. in a maximum diameter of 36 inches.
- Low specific fuel consumption — 0.450 lb/e.h.p./hr. at 36,000 ft. 400 knots cruising.
- Easy maintenance — independent unit construction.
- No turbine overheating — mercury vapour variable datum controller.
- Automatic propeller pitch coarsening.
- Safeguard — in the event of any mechanical failure between engine and gearbox the overspeed governor continues to be driven by the engine. The oil system pumps (driven by the propeller) continue to supply oil to operate the auto-pitch coarsening.

NAPIER Eland turbo-prop

Partners in Progress with The ENGLISH ELECTRIC Co. Ltd.

D. NAPIER AND SON LIMITED, LONDON, W.3. ENGLAND

CRC 15

With airplanes, as with icebergs, it's the hidden nine-tenths that causes the trouble.

In airborne electronic equipment, reliability and continuity of service depend on the detection of trouble before it manifests itself in unit failure. With planes, or with icebergs, it's rash to gamble when the odds are stacked against you.

Preventive maintenance is an essential part of airplane upkeep. The discovery of minor defects *before* they develop into major trouble spots is the purpose of periodic checks.

The Electronic Division of Reading Aviation Service, Inc., is fully equipped and staffed to service all types of electronic equipment.

To steer a safe course, take a heading for READING!

READING HAS MORE TO OFFER

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West Coast Talk . . . By Fred S. Hunter

- **Plans for a DC-6 non-stopper**
- **Jet transport projects very much alive**
- **What good's the key without the Cadillac**

THE "SADDLE" tanks which Douglas devised to put more range into the DC-7B are to be retained in the DC-7C. They add fuel capacity and improve the streamlining of the nacelles, netting a mile or so faster cruising speed. Now Douglas engineers are exploring possible ways and means by which about 3000 pounds more fuel might be put aboard the DC-6B. If this could be worked out, it would make quite a non-stopper of the 6B, too.

* * *

THE BOYS at Douglas are as inventive in their descriptive terms as in their designs. First, there was the "saddle" tank, a most appropriate word. They call another idea along this line the "slipper" tank. Next one, no doubt, will be the "girdle" tank, which, naturally, would be to "stretch" the range.

* * *

TWA'S ADVANCE scheduling, we hear, indicates its new Model 1049G Super Constellations, due from Lockheed starting in February, will fly Los Angeles-New York nonstop within 17 minutes of the DC-7 eastbound and 24 minutes westbound. TWA, we also hear, will observe the new speed by coming out with a snappy new uniform for its hostesses. The present uniform was designed by Mrs. Jack Frye in 1945.

* * *

CONVAIR has given up the idea of calling the R3Y-2 the "Flying LST" and will call it the "Tradewind," the same as the R3Y-1 . . . RAE HOPPER, vice president and general manager of the aircraft division of Hughes Tool Co., got his 15-year pin the other day . . . DON'T LET all the turboprop talk, or the confusion over the jet tanker competition, fool you into thinking Douglas and Lockheed may have dropped their commercial jet transport projects. Both the DC-8 and the L-193 are still very much alive . . . AEROJET-GENERAL, best known as a rocket engine manufacturer, has turned out more than a million 2.75 rockets in its sheet metal division.

* * *

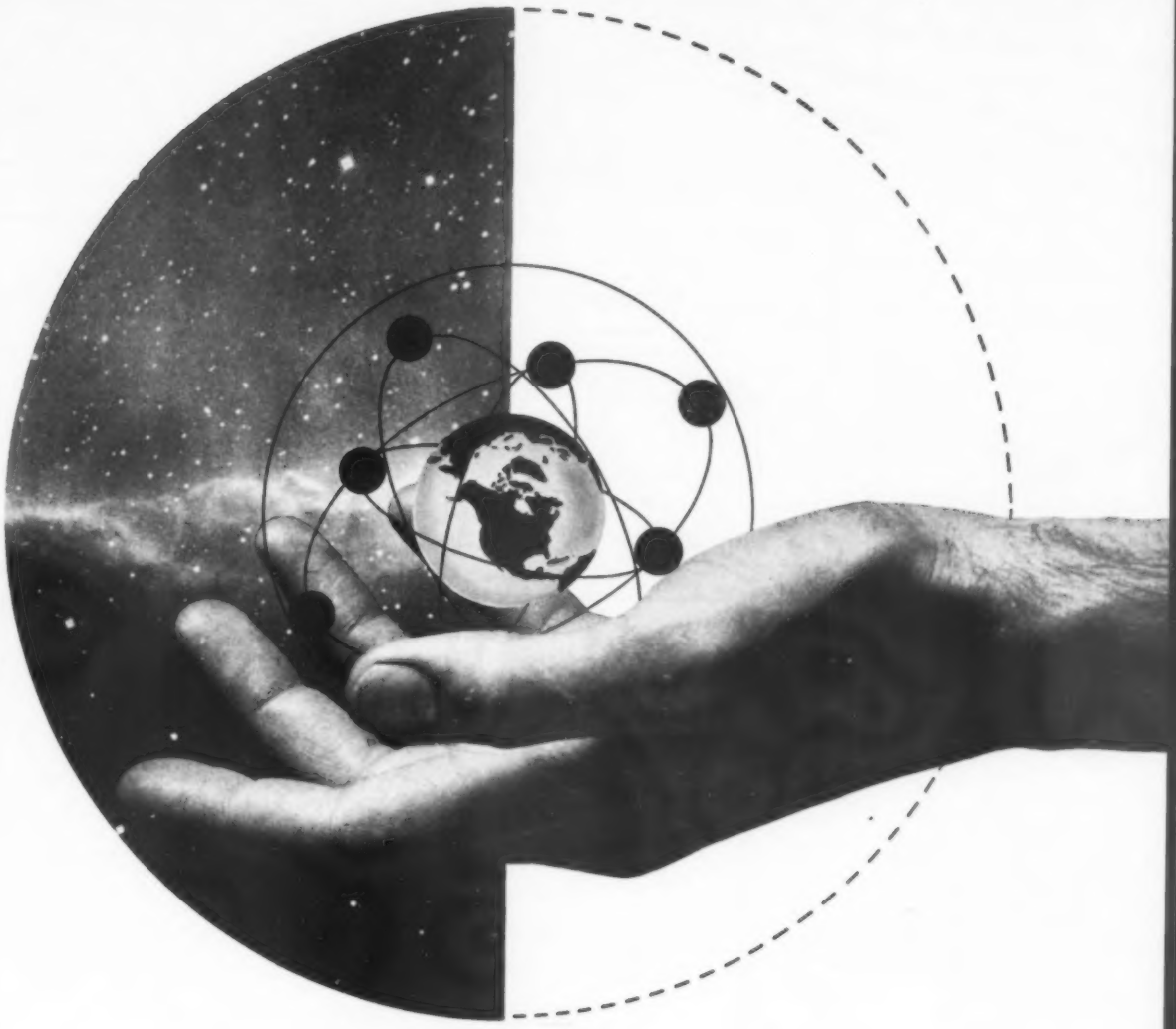
ED BURTON, chief engineer of the Santa Monica division of Douglas, was given a gold key to a 1955 Cadillac on his recent anniversary. But, alas, just the key, no Cadillac. This is the kind of high jinks a group of Ed's cronies dream up for the party staged each year at the Los Angeles Country Club to honor Ed. This year the theme was "This Is Your Life, Ed Burton," and the revelations, according to report, were simply wonderful. These annual affairs have been going on for seven or eight years now, and it's quite a tribute to Ed that old friends like Gus Poulson, Ed Chote, E. B. Sporleder, Vic Olson, Guy Evans, Ron George, Calder Mackay, Donald Douglas, Jr., and many others never fail to show.

* * *

IS BUAIR'S recent announcement that it had awarded the Douglas Aircraft Co.'s El Segundo division a $13,423,211 contract for armament fire control systems the first time the Navy has turned over weapon system responsibility of this character to an airframe manufacturer? It's for automatic fire control systems for the upcoming F4D-2, the new, bigger, and faster J57-powered delta-type fighter to be produced by Douglas. The fire control systems on the F4-1 (Hughes E-10) are government-furnished. Implication of the contract award is that Douglas will design its own system to assemble from components obtained from suppliers other than subcontract the entire job.

* * *

JACK FARLEY, chief of production flight test for Northrop Aircraft at Palmdale, took Northrop's president, Whitley C. Collins, up for his first F-89D ride recently, which qualified him for a Scorpin observer pin presented with appropriate ceremonies by Vice President John Myers . . . THE 1955 Beachcraft Bonanza is due January 14.



brand new world

As a major development in its program of advanced design, Martin has expanded its operations into the field of atomic power.

This means that a top team of scientists, physicists and engineers is now ready at Martin to carry on a strategic long-range program in the application of nuclear energy to weapons systems development.

Yesterday, Martin took the lead in recognizing the importance of electronics, integrating this new science into its operations with engineering and development facilities second to none in the industry.

Today, the horizonless science of nuclear power has been added—again ahead of the calendar.

And tomorrow you can expect Martin to develop techniques for harnessing the potential of each new science to come.

You will hear more about Martin!

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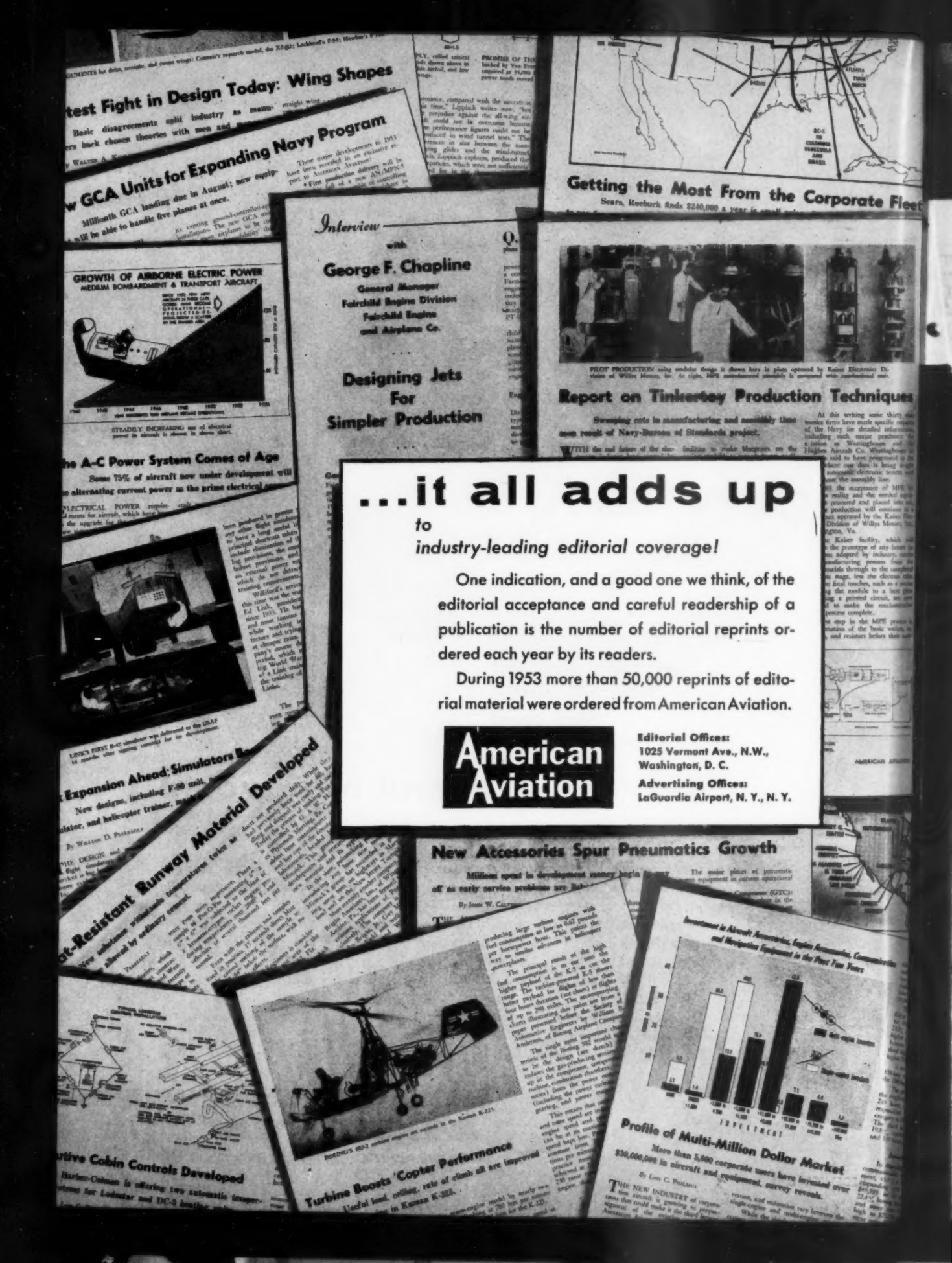
test Fight in Design Today: Wing Shapes
w GCA Units for Expanding Navy Program
Millionth GCA landing due in August; new equip.
will be able to handle five planes at once.
Getting the Most From the Corporate Fleet
Interview
with
George F. Chapline
General Manager
Fairchild Engine Division
Fairchild Engine
and Airplane Co.
Designing Jets
For
Simpler Production
GROWTH OF AIRBORNE ELECTRIC POWER
MEDIUM BOMBARDMENT & TRANSPORT AIRCRAFT
STEADILY INCREASING use of electrical power in aircraft is shown in above chart.
he A-C Power System Comes of Age
Some 75% of aircraft now under development will
e alternating current power as the prime electrical
PILOT PRODUCTION using modular design is shown here in plant operated by Kaiser Electronics Division of Willys Motors, Inc. At right, MPE instrumented assembly is compared with conventional unit.
Report on Tinkertoy Production Techniques
Sweeping cuts in manufacturing and assembly time
mean result of Navy-Bureau of Standards project.
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One indication, and a good one we think, of the editorial acceptance and careful readership of a publication is the number of editorial reprints ordered each year by its readers.
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New designs, including F-90 unit,
By William D. Pawley
t-Resistant Runway Material Developed
New Accessories Spur Pneumatics Growth
Million spent in development money begin
off as early service problems are
By Jesse W. Cal
Turbine Boosts 'Copter Performance
Useful load, ceiling, rate of climb all are improved
in Kaman K-225.
Investment in Aircraft, Accessories, Engine Accessories, Communication and Navigation Equipment in the Past Two Years
INVESTMENT
Profile of Multi-Million Dollar Market
More than 5,000 corporate users have invested over
$30,000,000 in aircraft and equipment, survey reveals.
By Lois C. Pawley
tive Cabin Controls Developed
Harlow-Coleman is offering two automatic temper-
ntrol for Lodestar and DC-3 heaters

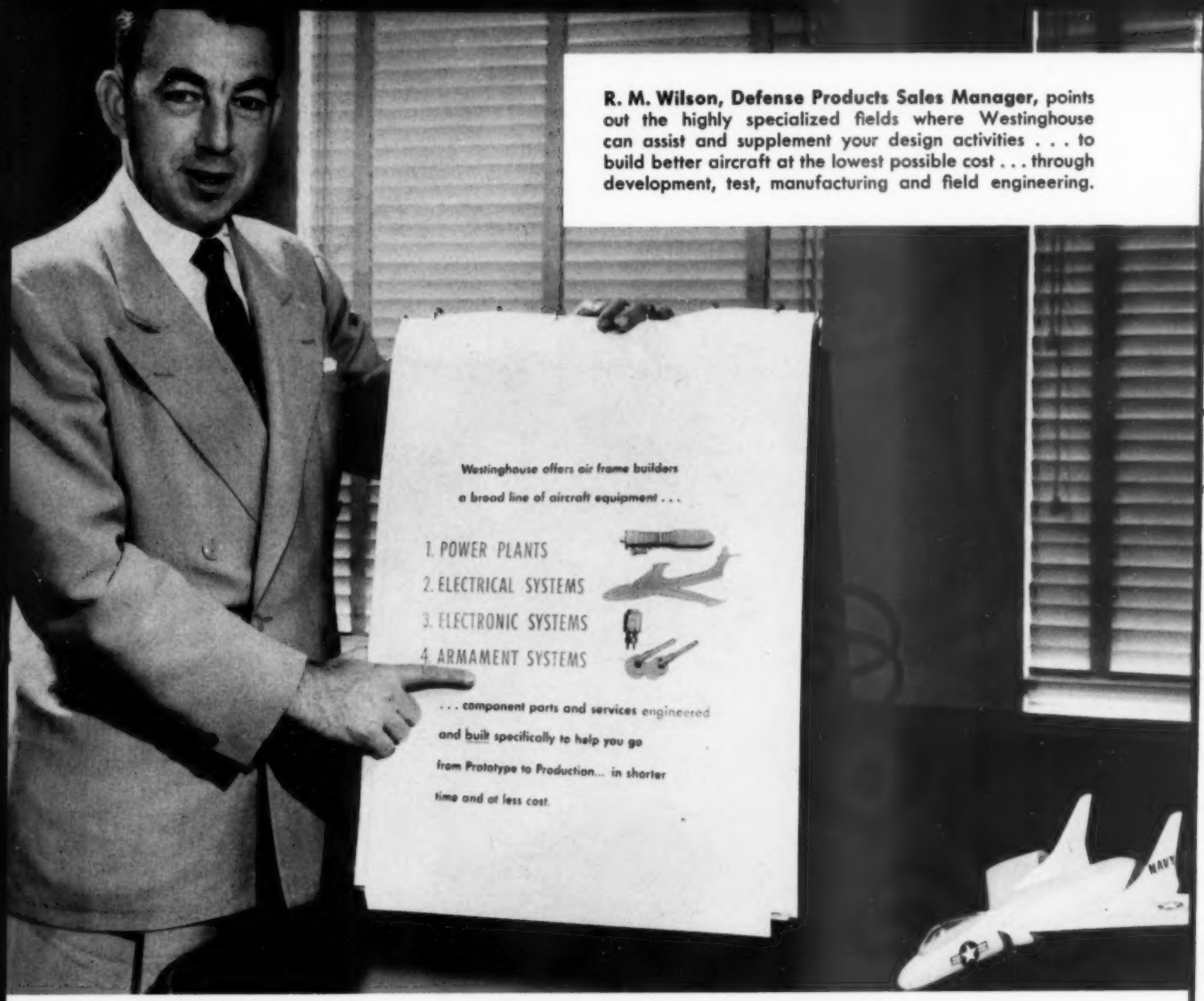
Prototype to production . . . in shorter time and at less cost

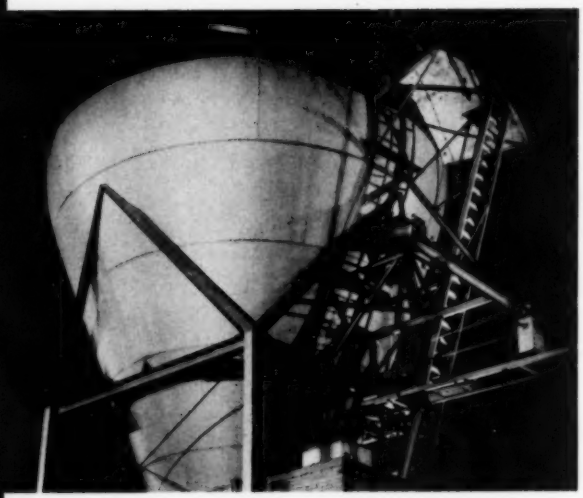
During systems study or systems development, project engineers face this challenge: Where to look and how to get the best of what's new? There's one unique source for the latest in technology and products . . . Westinghouse. Unique because of two vital factors: Unparalleled research and development facilities; and product families covering every phase of aviation—especially airborne electronics, electrical systems and motors, and airborne propulsion systems.

NOW . . . find out more about this unique source and the four big ways Westinghouse can help you . . .

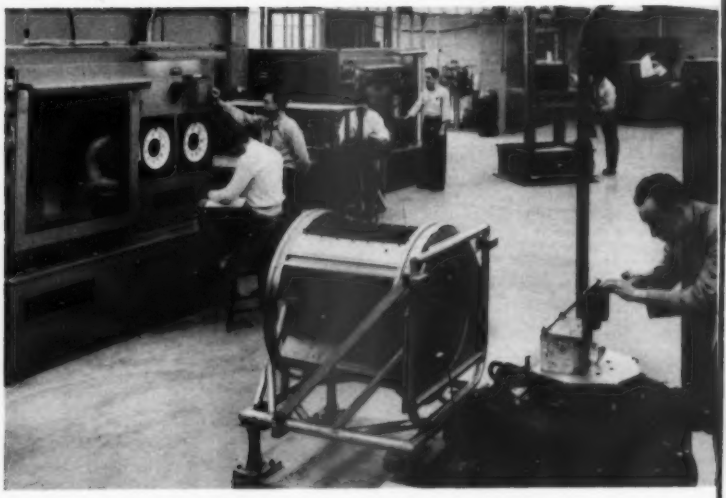
Westinghouse

R. M. Wilson, Defense Products Sales Manager, points out the highly specialized fields where Westinghouse can assist and supplement your design activities . . . to build better aircraft at the lowest possible cost . . . through development, test, manufacturing and field engineering.


Westinghouse offers air frame builders
a broad line of aircraft equipment . . .
1. POWER PLANTS
2. ELECTRICAL SYSTEMS
3. ELECTRONIC SYSTEMS
4. ARMAMENT SYSTEMS
. . . component parts and services engineered
and built specifically to help you go
from Prototype to Production... in shorter
time and at less cost.



The Van de Graaff generator of the Westinghouse Research Laboratory has long been recognized as the symbol of scientific pioneering undertaken by the Corporation. Efforts spread over the whole realm in search of new knowledge . . . much of which has contributed to the advancement of aviation.



At Air Arm Division, environmental type-test laboratories have every possible facility to test components and complete systems to the most rigorous specifications. This includes impact, vibration, sand and dust, salt spray and acceleration—with tests and evaluations being made throughout development and production.

Development labs constantly advance state of the art . . . are prime source of better systems concepts

Westinghouse has a basic credo: To develop the type of equipment and complete systems which will help airframe and equipment builders meet military and commercial specifications. Emphasis is on sound progress with the highest possible degree of dependability. To implement this, Westinghouse has over twenty-three laboratories working in every area where aviation may possibly be advanced, and these labs are staffed and equipped with attention to every skill and necessary device. The result: History has shown that Westinghouse research and development contribute continually to aviation progress—is a prime originator of new ideas and concepts. Here, then, is a potent source for better equipment and improved aircraft performance, from an experienced supplier capable of giving you the most for your aircraft dollar.

But what about test and evaluation? . . .

YOU CAN BE **SURE**... IF IT'S

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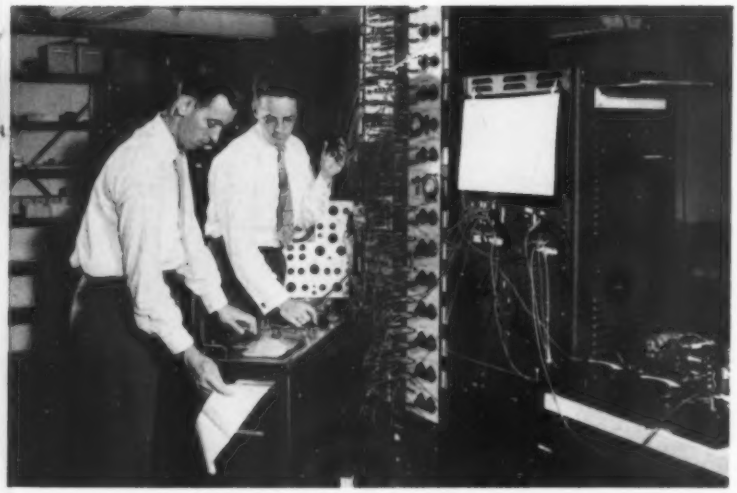
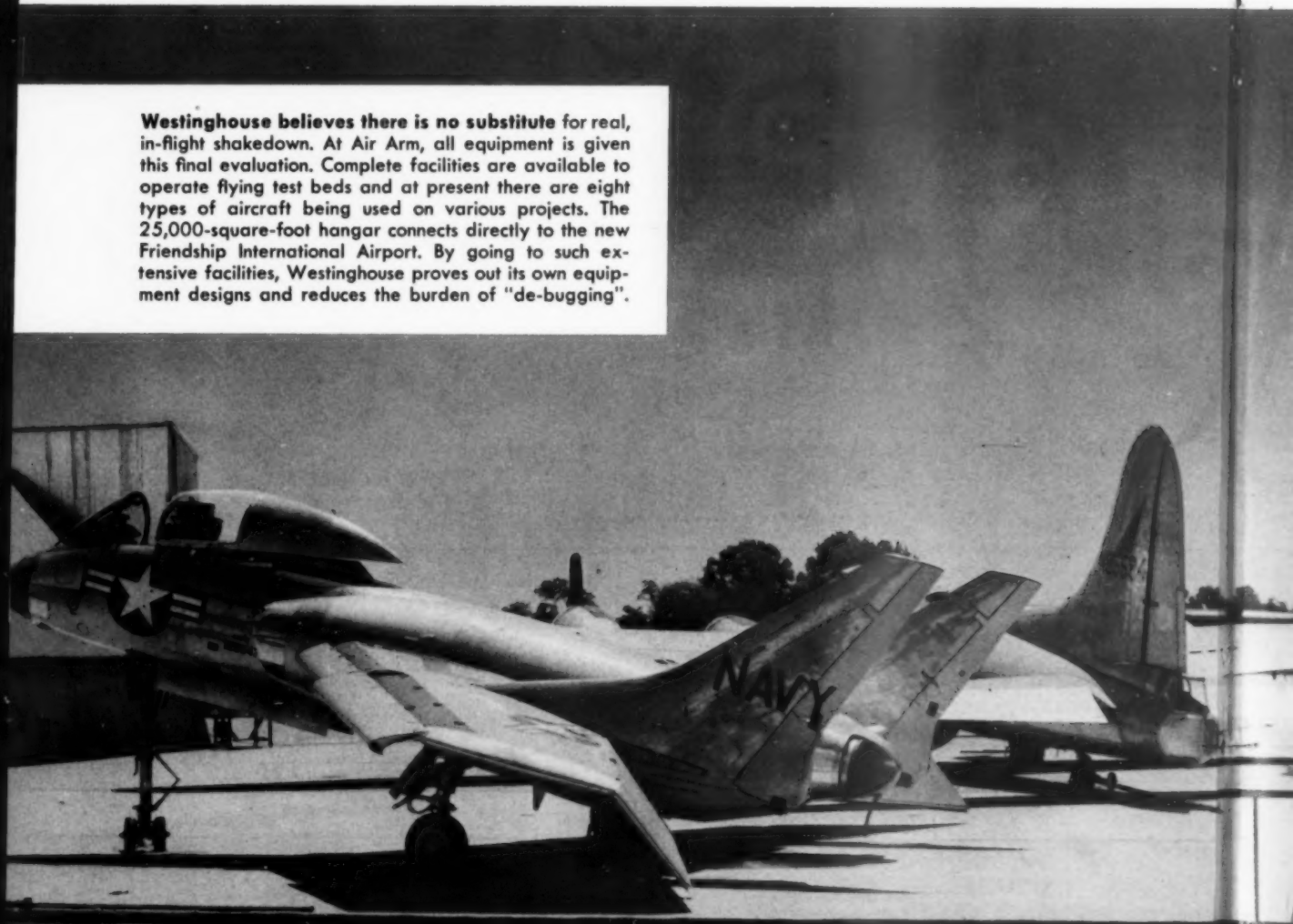


Westinghouse experience and facilities are invaluable when new concepts need a head start. Here, engineers skilled in the particular problems of aircraft electrical systems analyze a new project in the research room—with an analogue computer for running the gamut of every possible parameter—the first step toward design qualification.

The Aviation Gas Turbine Headquarters has one of the country's largest and most complete model shop facilities. A complete factory in itself, it is the center of continuing development and product improvement. New ideas are taken from design layout to prototype stage, then evaluated by actual performance testing.

Every known test used to prove components, qualify products . . . from concept to actual service

Westinghouse believes there is no substitute for real, in-flight shakedown. At Air Arm, all equipment is given this final evaluation. Complete facilities are available to operate flying test beds and at present there are eight types of aircraft being used on various projects. The 25,000-square-foot hangar connects directly to the new Friendship International Airport. By going to such extensive facilities, Westinghouse proves out its own equipment designs and reduces the burden of "de-bugging".



From long experience, Westinghouse knows the best plan is side-by-side development, test and evaluation—for no product or system is better than its ability to perform to specifications. Each Westinghouse Division has complete facilities—many of them Westinghouse-developed—for all required mechanical and environmental tests, simulating every possible airborne situation. Reliance is always placed on proved components and qualified products as the soundest answer to advancement. This Westinghouse test and evaluation concept is applied to products and systems at every stage of development and on through manufacture to actual service. It is one of your best guarantees that this source of ideas and products offers unusual "extras" in reliability, can give you extensive help in meeting the rugged test of specifications—all the way.

YOU CAN BE SURE...IF IT'S Westinghouse

The Aviation Gas Turbine Division—like all Westinghouse Divisions—places great stress on test, evaluation and qualification of all components and products. Here, a jet engine accessory is being given a complete operational check prior to release for installation. This same attention to performance follows every engine from development through production, where completed engines are given two complete test cell runs to prove that they meet specifications.

Life testing of all electrical apparatus plays a vital part in the Aircraft Department of the Small Motor Division. Highly specialized facilities—similar to the one shown above—test generators and motors under full load to determine brush life and stamina. The results are then cross-checked with other evaluations, such as high altitude chamber tests. Complete systems and their components can be tried and proved for performance under any climatic or mechanical environment.

Now, the end result of all this . . .

Jet engine pioneering—the Aviation Gas Turbine Division plant covers almost eighty-five acres in Kansas City, Missouri. It houses jet engine research, development and production—all under one roof and equipped with the latest facilities.

Specialized plants and corporate facilities give capacity, flexibility . . . produce to specifications

Westinghouse in aviation also means the best and most complete plants and production facilities capable of building precision and ruggedness into every product. The Westinghouse aviation family offers three-way flexibility to assure both quality and quantity: Twenty-three divisions specialize in their product lines; strategic locations and special headquarters facilities put product "families" close together, make it possible to utilize skills and capacity of other plants whenever necessary; modern production equipment takes full advantage of new techniques, constantly produces to close specifications. These are all big reasons why Westinghouse can offer such extensive help in backing up your design efforts on new aircraft.

The Air Arm Plant in Baltimore integrates all airborne electronics activities under a single, Westinghouse-owned roof. Complete development, test and manufacturing facilities are available to you, the finest anywhere in the industry.

The Small Motor Division at Lima, Ohio, combines experienced technology, modern equipment and extensive "mock-up" facilities to design and build highly advanced aircraft electrical systems, drives, motors and controls.

Engineering follow-thru insures performance, gives user full value of equipment and systems

From prototype on, Westinghouse field engineering is of vital assistance in helping you qualify the aircraft for operational service. Engineers are highly skilled in their product lines, ready to provide all necessary assistance for successful use of products and systems. This also is a Westinghouse credo: To assure product performance, to give the user benefits of continuing technical advances in design and application, and to assist in training of operational and maintenance personnel. By providing this full measure of service, Westinghouse can intelligently and sincerely offer airframe and equipment manufacturers a complete partnership, directed toward selection and application of the best possible equipment and systems for the job.

Now . . . see how to put Westinghouse on your team . . .

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Look to Westinghouse—get newer concepts, better systems for greater margins of technical superiority . . . prototype to production

By now we're sure you realize . . . aviation is very much our business. These Westinghouse facilities—barely covered here—offer you a real, hard-working source for solving aviation problems. Advancement comes both from individual product developments and from basic areas like metallurgy, fuels, combustion and nuclear energy. Much of it, of course, is classified, but readily available for use by qualified recipients.

The real story here is how we can help you. Whatever your problem, at any stage of design or modification—whether in airframe work or equipment manufacture . . . it's a good bet that Westinghouse can give you valuable assistance. But most important, Westinghouse has the unique capability to help you all the way—all the way from prototype to production, and help you do it in shorter time and less cost.

Here is the Westinghouse Aviation Family, covering every phase of aircraft operation:

Basic aircraft systems

Turbojet Engines • Fire Control • Radar • Autopilots • Communication Equipment • Electrical Systems • Defensive Systems and Guided Missile Components.

Airborne system components

Transformers • Rectifiers • Instruments • Gyro-motors • Temperature Control Panels • Generating Equipment and System Control • Circuit Breakers • Contactors • Motors • Actuators and Hoists • Electronic Tubes • Magamps • Micarta®.

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For general information and technical literature, just check and send the coupon below. . .

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- ☐ Airborne Power for Tomorrow's Aircraft **B-6392**
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- ☐ Aircraft Electrical Systems
- ☐ Aircraft Motors
- ☐ Airborne Radar
- ☐ Automatic Pilots
- ☐ Armament Systems
- ☐ Other.....

Name.....Title.....

Company.....

Street.....

City.....State.....

J. V. NAISH, executive vice president of Convair, signs the contract under which D. Napier & Son, Ltd., of London, purchased a Convair 340 for flight testing of the Napier Eland turboprop engine. H. Sammons, managing director, signed for Napier.

MATS Air Mail May Go Commercial

Military air mail in sizable amounts may be taken from the Military Air Transport Service and turned over to commercial airlines. A directive arranging such a move is being drafted by the office of Assistant Defense Secretary *(Supply and Logistics)* Thomas P. Pike, according to Pentagon officials. The Post Office and CAB have already been consulted.

Present plan affects Europe-to-U.S. and westbound Pacific mail primarily. Most mail moving in the other direction is already handled commercially.

MATS has flown an average of 20,000 tons of mail annually during recent years.

Reasons for the change are given as desire to reduce government/industry competition, better service, and reduced airline subsidies due to additional mail pay.

Navy Official Predicts Nuclear Seaplanes

A mobile, well-integrated seaplane force is an essential for nuclear warfare, possessing unique advantages and ideally adapted to the use of nuclear aircraft propulsion, the American Legion has been told by James H. Smith, Jr., Asst. Secretary of the Navy for Air.

← Circle Numbers on Reader-Service Card.

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81 Airborne Power for Tomorrow's Aircraft B-6392
82 Jet Engines
83 Aircraft Electrical Systems
84 Aircraft Motors
85 Airborne Radar
86 Automatic Pilots
87 Armament Systems

How Long Does It Take To Really Finalize a Mail Rate?

THERE HAVE BEEN strong representations that the local service airline industry and the government would benefit substantially, through improved operating efficiencies, if the time required to establish final mail rates could be reduced radically and if final rates could be designed so that they would have more permanence.

A final rate is one in which no upward or downward adjustments are made during its duration. If such adjustments are desired by the carrier or the government, a challenge is filed and the rate thus becomes temporary from the date of challenge to the effective date of a new final rate.

The accompanying tables furnish comprehensive, first-time information on the history of local service airline mail rates with respect to various time elements involved in the processing of such rates.

HOW LONG IT TAKES TO OBTAIN FIRST FINAL MAIL RATES

Inaugural Year	No. Carriers Starting	Ave. Days
1945	1	701
1946	4	741
1947	3	861
1948	3	1131
1949	7*	1229+
1950	3*	1155+

* Includes in each year one carrier with initial rate not yet finalized as of August 31, 1954.

HOW LONG IT TAKES TO OBTAIN SUBSEQUENT FINAL MAIL RATES

Year of Rate Reopening	No. Rates Reopened	Ave. Days
1948	1	283
1949	6	433
1950	1	798
1951	3*	461+
1952	8	253
1953	7*	292+
1954**	1*	153+

* Includes in each year one or more rates not finalized as of August 31, 1954.
** Up to August 31.

HOW LONG FINAL RATES ENDURE

Year Rate Established	No. Rates Reopened	Ave. Duration in Days
1947	1	251
1948	4	326
1949	4	424
1950	4	608
1951	6	272
1952	6*	278+
1953	7*	258+
1954**	4*	153+

* Includes in each year one or more rates still closed as of August 31, 1954.
** As of August 31.

HOW LONG INDIVIDUAL CARRIERS HAVE OPERATED UNDER CLOSED MAIL RATES

Name of Carrier	No. Days In Operation**	No. Days Under Closed Rates	% Time Under Closed Rates
Empire	2134	1413	66.2%
Frontier	1553*	855+	55.1
Wiggins	1413	616	43.6
Southwest	2830	1177	41.6
Trans-Texas	2517	1019	40.5
Pioneer	3318*	1283+	38.7+
Bonanza	1717*	658+	38.3+
West Coast	2827	1026	36.3
Piedmont	2385	741	31.1
Mohawk	2173*	600+	27.6+
Monarch	1282	350	27.3
Allegheny	2004	546	27.2
Southern	1909*	511+	26.8+
Florida	809	142	17.6
Lake Central	1753*	196+	11.2+
Ozark	1436*	117+	8.1+
North Central	2381	118	5.0
Challenger	1125	32	2.8
Central	1813	0	0.0
Parks	11	0	0.0
Mid-West	938	0	0.0
Averages	1825	543+	29.7+%

* Carrier operating under closed rate as of August 31, 1954.
** As of August 31, 1954.
Source: CAB Orders.

LEADERSHIP DEMANDS CONSTANT ACHIEVEMENT

BIGGER RADOMES FOR MORE PROTECTION. The radar Super Constellation picket plane is an extremely vital unit for U. S. protection. It can warn the nation hours earlier of enemy attack, because it has long range, high speed, plus six tons of electronic intelligence packed in radomes as big as swimming pools (like the bottom one pictured above).

WORLD'S FASTEST PROPELLER-DRIVEN AIRPLANE is turbo-propeller Super Constellation for the U.S. Navy (shown below). Now flying, it will be capable of speeds 100 mph faster than any propeller airplane now in service. Powered by Pratt & Whitney T-34 turbo-propeller engines, this plane promises new speed, new performance and greater economy potentials.

NEWEST TRANSPORT CONCEPT is Lockheed's C-130A turbo-prop assault transport, shown here in its dramatic first flight. Now in production at Government Aircraft Plant No. 6, operated by Lockheed's Georgia Division in Marietta, this giant plane literally jumped off the runway in one-third the distance required for today's commercial transports. This new cargo plane incorporates scores of new features for better handling of troops, materiel and equipment.

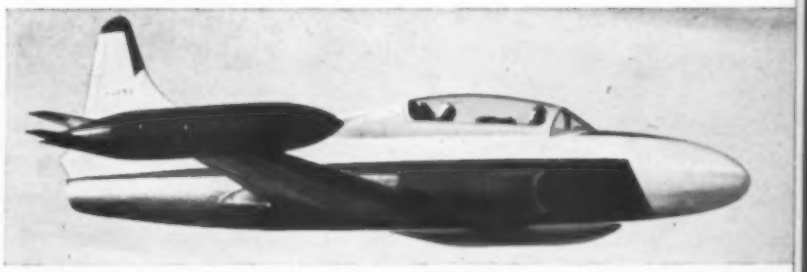
6 New Lockheeds for U.S. Protection

Powerful Team Includes Truly Amazing Jet Fighter, High-Speed Assault Transport and Vital Picket Plane

1954 has been a notable year for Lockheed, in research, development and production. Six new models in one year include: world's fastest propeller-driven transport; world's first turbo-prop assault transport; latest version of the Navy's Neptune anti-submarine patrol bomber; a new advanced jet trainer for the Navy, and a truly amazing jet fighter, the F-104 now in production, which is too secret to photograph or describe.

On these pages are shown all new models except the restricted F-104. Also photographed is the vital Super Constellation picket plane, with fantastic top and bottom radomes. The bottom radome, for example, creates between 30,000 and 60,000 pounds of drag pressure, yet to hold it securely in place only 10 bolts are needed, due to ingenious Lockheed design.

FLIES STRAIGHT UP, LANDS STRAIGHT DOWN. This is the Lockheed XFV-1 Vertical Ascender, a revolutionary new concept of aircraft developed in cooperation with the U.S. Navy. Now, every ship can have its own protective fighter umbrella, every back yard could become a landing field if needed.



NEW NAVY ADVANCED JET TRAINER. Often called the world's safest jet airplane, Lockheed's new T2V-1 advanced trainer for the U.S. Navy has so many new safety and performance features it can be used for carrier landing and takeoff and can utilize existing short fields for propeller aircraft. By training better jet pilots quicker, this trainer boosts Navy's ability to protect America. Another product of close Navy-Lockheed design teamwork.

ADVANCED GUIDED MISSILE SYSTEMS DEVELOPMENT

Eminent scientists, nuclear physicists, and engineers have joined forces at Lockheed's new Missile Systems Division in Van Nuys, California. Their mission is to solve the nation's prime defense problem, to give our armed forces *totally* reliable means of delivering our defensive and retaliatory weapons to their targets. To accomplish this vital task, Lockheed has appropriated $10,000,000 for a program of laboratory research and development.

Lockheed

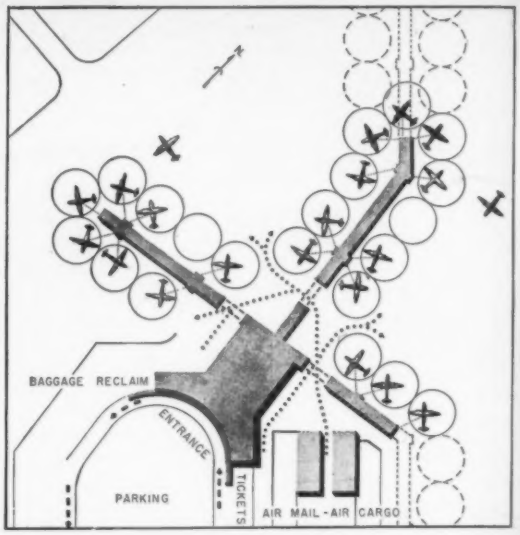
AIRCRAFT CORPORATION

California Division—Burbank, California
Georgia Division—Marietta, Georgia
Missile Systems Division—Van Nuys, California
Lockheed Aircraft Service—Burbank, California
Lockheed Air Terminal—Burbank, California

LOOK TO LOCKHEED FOR LEADERSHIP

NEWEST SUB HUNTER is the Navy's latest version of the Lockheed P2V Neptune Patrol Bomber, a rugged, radar-laden flying sentinel with many secret missions. Its primary job: patrolling coastal waters against possible enemy submarines. Note new jet engines for added speed, power.

LOVE FIELD IN DALLAS expects to start its new terminal building early in 1955. It features single-floor terminal operation with minimum walking distances to the three-way expandable loading piers designed to bring maximum number of gate positions within a minimum radius of the lobby. Moving sidewalks will carry passengers from terminal to loading areas.

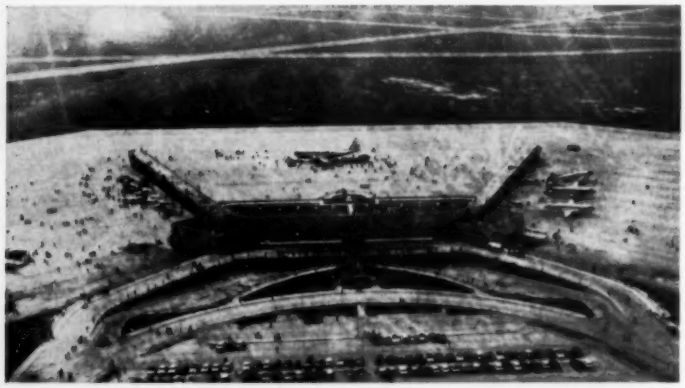


HERE'S A LOOK AT THE NEWEST IN AIRPORTS AND TERMINALS

Despite lack of federal aid funds for fiscal 1954 and exclusion of terminal buildings from the 1955 program, new construction has been flourishing at the nation's airports. The last two months have seen more than a dozen new terminals dedicated and many planned.

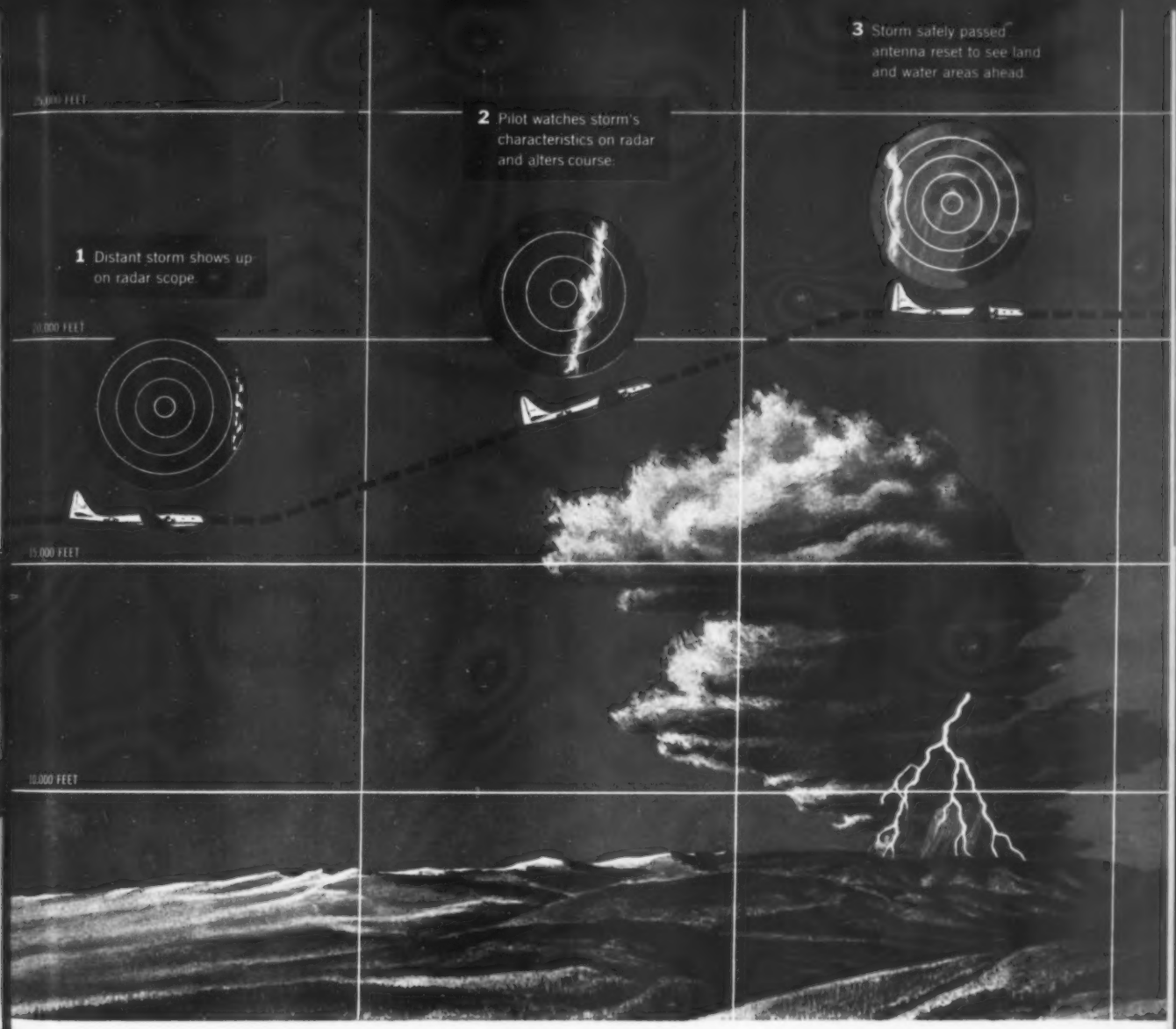
HONOLULU will begin construction in December of a new $4.5 million terminal of ultra-modern design. It will provide three times the capacity for overseas traffic and about twice the capacity for inter-island traffic as present facilities. It will include services for both land and sea aircraft.

WICHITA'S NEW $10 MILLION municipal airport gives general aviation equal status with airlines. Along the access road are general aviation buildings, with showrooms for aircraft dealers. New terminal building features a seven-story control tower.



HOUSTON'S $5 MILLION TERMINAL has a completely equipped 13-room hotel. Airlines, concessions, and administrative offices have 100,000 sq. ft. of floor space. Two double-level fingers extend from the field side of the building and are equipped with escalators. Passengers go through the upper level with baggage transported through the lower level.

NEW $1 MILLION TERMINAL in Worcester, Mass., features two separate structures. The main administration building houses airline ticket offices and consumer services. Control tower building is occupied by CAA, a fixed-base operator, and a fire and rescue station.


3 Storm safely passed; antenna reset to see land and water areas ahead
2 Pilot watches storm's characteristics on radar and alters course.
1 Distant storm shows up on radar scope.
10,000 FEET
5,000 FEET

NEW RADAR GIVES USAF POWERFUL EYES

Sees Storms, Obstacles up to 240 Miles Away

THE STORY BEHIND THE STORY:

Unveiled at the National Aircraft Show in September, the new Sperry APN-59 Radar developed for the Air Force made headlines like the one above from coast to coast —and for good reason.

Airmen have needed, and wanted, truly versatile radar. To make navigation more accurate . . . to aid in flying over obscure, uncharted terrain . . . to elude storms . . . to avoid collisions . . . to direct rescues regardless of visibility. But—there has been a problem: Existing radars, to perform all of these functions, have required too much space and added too much weight.

Working with the Air Research and Development Command, Sperry engineers solved the problem by producing a new airborne radar that requires less space than a passenger, weighs less than 150 pounds.

And versatile? Despite its small size ar weight, this new APN-59 Radar now giv airmen a selection of ranges from 3 to 2 miles—a choice of "looking" straight ahea below or above—and permits concentrati on any particular area of importance.

Developing the APN-59 Radar broug into play many of Sperry's specializ skills. Electronics—a field in which Sperry development of the Klystron provided t heart of today's microwave radar. Gyr scopics — to assure "picture" stability rough, turbulent air. And, of course, sour instrumentation based on Sperry's 40 yea of experience in establishing standards f the aviation industry.

SPERRY GYROSCOPE COMPANY

DIVISION OF THE SPERRY CORPORATION • GREAT NECK, N.

Circle No. 88 on Reader Service Card.

By William V. Henzey

CAB TO RECOMMEND ELIMINATION OF NWA'S ANCHORAGE SERVICE

A SOLID REPUBLICAN front in CAB has now decided to recommend to President Eisenhower that Anchorage, Alaska, be eliminated entirely from Northwest Airlines routes and that Pan American World Airways be certificated to the point instead.

A majority also is said to favor renewal of Pacific Northern Airlines between Seattle and Anchorage and non-renewal of Alaska Airlines between Seattle and Fairbanks.

A top aviation official of the State Department has written CAB opposing action which might grant necessary extensions for Northwest and Trans-World Airlines to form a round-the-world connection at Tokyo.

These are the three newest developments in CAB's hectic Pacific area cases in which the Commerce and State departments now appear to be playing an influential role. There are also reports that CAB's three Republican members, each with visions of the chairmanship for 1955, are not disposed to vote contrary to administration thinking that may be reflected in the two cabinet offices.

The decision to drop NWA from Anchorage came at a private board meeting on November 19, and saw vice-chairman Harmar D. Denny joining in with chairman Chan Gurney and member Oswald Ryan for complete elimination of NWA from the Alaskan point. Previously, Denny supported renewal of Anchorage on NWA's through route to Tokyo but non-renewal of shuttle rights between Seattle and Anchorage. (AMERICAN AVIATION, Nov. 22.)

Northwest supporters in CAB contend an "Unrestricted Anchorage" is the backbone of the line's north Pacific route to Tokyo, and that elimination or curtailment of such service would so soften the trans-Pacific route as to make eventual self-sufficient operations virtually impossible.

The present CAB plan would substitute a two-carrier States-Alaska system for the present four-carrier network: Pan Am and Pacific Northern the survivors and Northwest and Alaska Airlines the non-survivors.

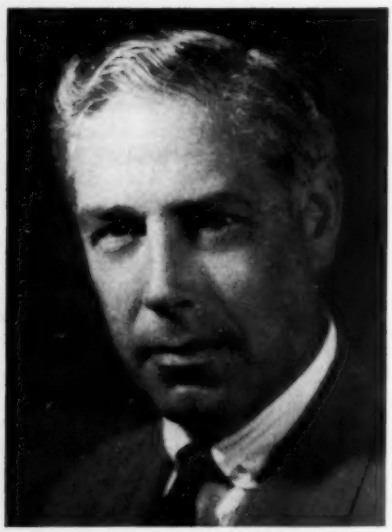
On the TWA-Northwest Tokyo phase, J. Paul Barringer, director of the State Department's office of transport and communications policy, wrote CAB in mid-November against the proposed TWA-Northwest link-up. TWA, which now terminates its international operations at Colombo, Ceylon, has proposed extension to Tokyo to connect with NWA's trans-Pacific route.

This had been given more weight in CAB thinking than NWA's proposed extension to meet TWA in India.

But until Barringer's letter, CAB members favored deferral of action on the two applications because of unsettled political conditions in the Far East. Now there are indications that CAB will disapprove the extensions because they have had an expression from a cabinet level. Normally, the cabinet has its say after a CAB decision goes to the White House for presidential action.

TWA and Northwest have argued that their proposed round-the-world service would stimulate travel as it has in the Atlantic. They point to some interesting statistics to support this argument and to deflate chosen instrument arguments which have cropped up in the course of cabinet intervention in the CAB's deliberations.

For example, in 1953, in the five countries in which Pan American operates without competition from a U.S. carrier, according to the airlines' figures, foreign carriers have captured about 95% of the market. In the six European nations where TWA and Pan Am compete, the U.S. lines have carried 75.7% of the U.S. citizens traveling and 67.4% of the combined total of U.S. citizens and aliens traveling.



State Department's Barringer
Opposes TWA-Northwest link-up

Secretary Weeks
Cabinet intervention is pronounced

The State Department opposition to TWA and Northwest is also puzzling some CAB officials whose capacity to act does not go beyond economic matters. One such official pointed out that almost simultaneous with transmittal of Barringer's letter to CAB, Secretary of State Dulles revealed publicly that a group of financial experts was considering a Marshall Plan for the Far East with many millions of dollars reportedly earmarked for that area.

Presently, there are four major international cases before CAB which eventually must go to the President for final action. Three of them are Pacific area cases—Trans-Pacific, West Coast-Hawaii, and States-Alaska. Fourth case is the New York-Balboa Through Service Case involving proposed interchanges to and from Latin America.

The Balboa Case, decided by a 4-1 vote, with member Ryan dissenting, recommends that the President: (1) deny the proposed Eastern-Pan American interchange; (2) approve a through service via Pan Am, Panagra, and National; and (3) approve a through service via Braniff and Eastern.

But as in the Pacific cases, cabinet-level intervention has been and still is pronounced. Secretary of Commerce Sinclair Weeks and Under Secretary for Transportation Robert B. Murray pre-

"Fleet Fighters"

Potent Chance Vought F7U-3 Cutlasses stand poised on the flight line, ready for delivery to fighter squadrons of the U. S. Fleet. Outstanding examples of Naval Aviation's new hard-hitting strength, these swift, powerful aircraft are designed to serve as interceptors, fighters or attack planes.

Chance Vought Aircraft INCORPORATED

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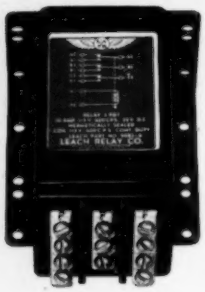

Field-tested Leach Precision Relays like this hermetically-sealed 400 cycle aircraft relay undergo rugged usage and it is essential that the precision schematic lettering remain easy to read and bonded for life to the relay—and Leach has standardized on one method of identification—Metal-Cal—the ultimate in labeling.

Metal-Cals
come in a variety of colors—matte or shiny finish—any size or shape.

Metal-Cals
adhere permanently to any smooth surface—flat or curved—without screws or rivets.

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Circle No. 90 on Reader Service Card.

viously were aligned with forces advocating a sell-out by Braniff of its international route to Panagra.

This fell by the wayside and Weeks is now reported to have requested that CAB's new 4-1 decision be referred to him when it is turned over to the executive branch by the board.

Weeks also was reported recently as not being in favor of certification of Seaboard & Western Airlines for a trans-Atlantic all-cargo route although a 3-2 CAB decision favoring such a route is still undecided at the White House. In discussing the Seaboard case, Weeks is considered further to have clouded the domestic all-freight renewal case involving Slick and Flying Tigers by pointed references to the merger difficulties which the two lines encountered this year.

Significantly, the Slick-Tigers case, in which hearings won't even begin until January, is solely a domestic case in which CAB supposedly has the final say and not the executive branch as in international cases.

There is still another domestic case, not yet announced, in which the Commerce Department is considered by some CAB members to have been responsible for a majority Republican vote. It is the merger of Pioneer Airlines, a local service line, into Continental Air Lines, a trunk. CAB's three Republican's voted to approve the merger and it should be released shortly.

Inherent in that case is the elimination of a local service airline, a matter also inherent in the Weeks-backed civil air policy report.

In all, it amounts to a substantial weakening of CAB's stature as a quasi-judicial deliberative body. By law, CAB is an arm of Congress and is to exercise independent judgment with the executive branch voicing its opinions in international cases after they have been transmitted to the President.

Now, cabinet-level intervention in all phases of domestic and international cases and an adherence by the board majority to such intervention has become almost matter-of-course.

(More CAB News, page 84)

As of Now . . .

The New York-Balboa Through Service Case, though decided by CAB in September, is just now ready for submission to the White House. Holding it up was the preparation of one Board Member's dissenting opinion. As in other decisions in the case submitted by CAB, the latest recommends interchanges via Pan Am, Panagra, and National, and via Eastern and Braniff.

Eastern has begun its case in the **Additional Northeast-Southwest Service Proceeding** as the lengthy hearings which started early in September continue in progress.

Procedural steps will get underway this month in the **Helicopter Air Service Renewal Case** in which the Chicago rotary-wing operator seeks renewal, route adjustments, and passenger-carrying rights. Still no decision in CAB though, on what to do with the 50 or more pending applications for new helicopter operations.

Recent CAB Decisions

Swissair's trans-Atlantic foreign permit amended to include Manchester, England, as an intermediate, and to authorize terminal service to "a point or points in Switzerland" in lieu of "Geneva and Zurich."

Seaboard & Western Airlines' and **Transocean Air Lines'** tariffs naming cargo rates for military mail ordered cancelled in view of finding that such mail is not "property" under the Act.

CAB Applications

Riddle Airlines applied for exemption to operate all-cargo service between Boston and Philadelphia, on one hand, and points in Florida, on the other.

Piedmont Aviation applied for extension of its local service route from Lynchburg, Va. to Washington, D. C. via Charlottesville, Va.

CAB Calendar

Dec. 6—Hearing, Reopened Trans-Atlantic Final Mail Rate Case. Washington, D. C. Docket 1706 et al.

Dec. 6—Hearing, Sioux Falls Service Case (Western Air Lines). Sioux Falls, S. D. Dockets 3476 & 5879.

Dec. 7—Hearing resumed, Eastern-Colonial Control Investigation. New York, N. Y. Docket 6582.

Dec. 7—Prehearing conference, Helicopter Air Service Renewal Case. Washington, D. C. Docket 6600.

Dec. 15—Hearing, United Air Lines Mail Rate Case—Hawaiian Operations. Washington, D. C. Docket 2913.

Jan. 5—Hearing, Reopened Fayetteville Service Case. Washington, D. C. Docket 5592.

Not for the public

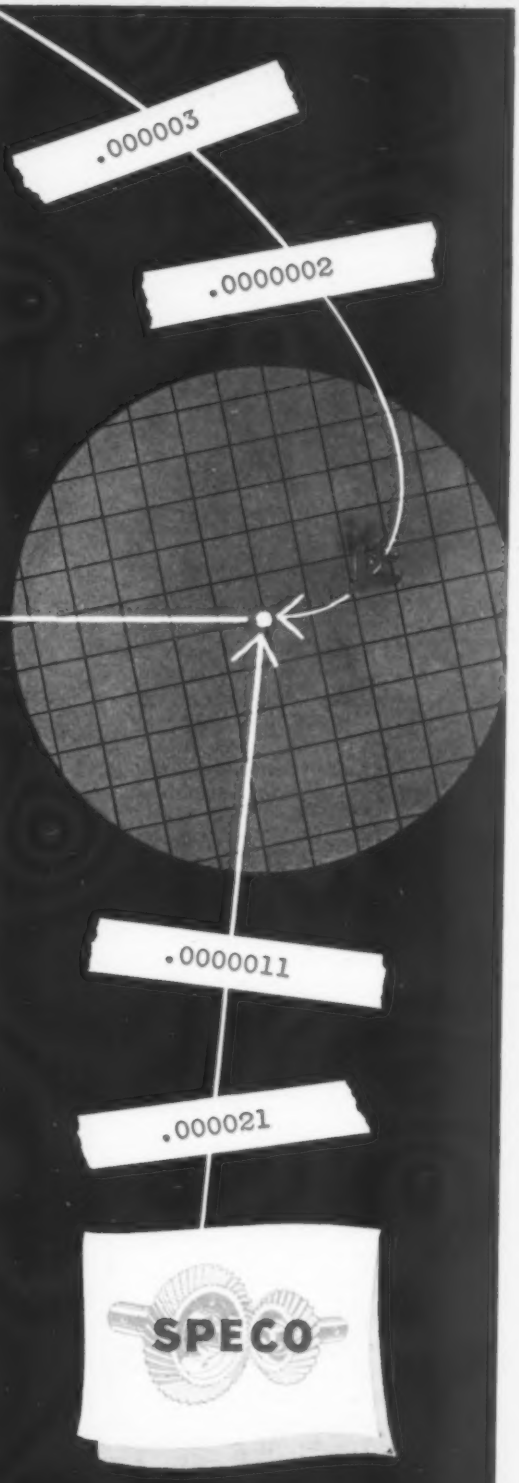
The Republican "caucus" which preceded several important 3-2 CAB decisions a year ago is now back in evidence. Procedure is for members **Gurney, Denny, and Ryan,** to meet in one of their offices before a meeting of the full board on a major subject.

Still paramount at the board, however, is the Ryan membership which expires December 31. In addition to Ryan who is actively seeking re-appointment, early names in the hopper include **Colin H. MacIntosh,** commercial official, **Lyle Newcomer,** California attorney, and former member **Harold A. Jones.**

The top confidential item within CAB is that involving air routes between the U.S. and Mexico. It will be one of aviation's biggest stories when it breaks.

How many places

east of the decimal point?



• We haven't yet found this on a drawing but... on a bombing or computing gunsight, an almost infinitesimal decimal error in the device itself, may well be multiplied to hundreds of yards, at the target area.

We help forestall such errors and results by producing gear assemblies of the utmost precision ... for computers, for accessory drive units, actuators, transmissions and controls. We also produce precision components such as bomb hoists, gun turrets, radar tracking and scanning assemblies.

Bring us your development and production problems, large or small. Our long, proven experience can solve them. A letter or telephone call will put us at your service.

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Eastern Charges American and Pan Am Blocked Mexico City Route

Charges by Eastern Air Lines' board chairman E. V. Rickenbacker that American and Pan American were responsible for delays in connection with EAL's New Orleans-Mexico City route, and a counter-move by American that EAL negotiated privately with Mexico for a route overflying New Orleans marked turbulent hearings before CAB last month in the New York-Mexico City Nonstop Case.

Rickenbacker told CAB examiner Edward T. Stodola he was told in "no uncertain terms" by top officials of AA and Pan Am that efforts would be made to block implementation of the EAL route, granted by CAB in 1946 but never operated in the absence of a bilateral agreement between the U.S. and Mexico.

Earlier, Eastern's counsel, E. Smythe Gambrell and Glen Harlan, filed an application with Stodola for the issuance of subpoenas to force CAB members, CAB staff officials, and State Department officials to testify in connection with negotiations, conferences, etc. in connection with U.S.-Mexico routes since 1946. But this request was denied by Stodola.

Hearings center around which of three U.S. carriers—American, Eastern, or Pan Am—will be authorized to fly non-stop between New York and Mexico City to compete with Air France which has been in the market since January 1954.

Eastern, supported by New Orleans Mayor Delesseps S. Morrison, Louisiana Senator Russell B. Long, and Georgia's Attorney General Eugene Cook, argued that CAB should not go ahead with plans for a New York-Mexico City route before deciding the fate of EAL's 1946 certificate.

On September 8, 1952, then-President Truman issued a letter "withdrawing his approval" of Eastern's certificate, along with others issued to Braniff and Western. The validity of the Truman action has been contested and is now being weighed by the Eisenhower administration.

American made its counter-move in the hearings on cross-examination of Rickenbacker. AA's counsel Howard C. Westwood and C. J. Stratton produced a document dated August 3, 1951, and signed by Rickenbacker and Angel Martin Perez, chief of Mexico's Department of Civil Aeronautics.

The document, which Rickenbacker said was "no more than a memorandum," called for Perez to "recommend to the high authorities of the Ministry of Communications and Public Works" that a U.S. carrier be authorized to operate unlimited between Mexico City and Birmingham, Atlanta, Washington, and New York with full non-stop rights at each U.S. point.

Such an award would be conditioned upon U.S. authorization to a Mexican line to operate between Mexico City and New Orleans.

The move resulted in Gambrell taking the stand to testify that the arrangement was "strictly informal" and designed only to show that Mexico apparently was willing to negotiate for independent routes.

It was also noted that the meeting which led to signing of the document followed an authorization, dated July 24, 1951, from a State Department official to Eastern for "informal conferences" with the Mexicans. The letter, signed by Edward G. Miller, Jr., Asst. Secy, of State, also cautioned against committing the U.S. to any air routes with Mexico.

Although the document signed by Rickenbacker and Perez was not previously made public, Gambrell said it had been shown "within days of signing" to then-CAB chairman Donald W. Nyrop and Miller of the State Department.

Rickenbacker, meanwhile, named C. R. Smith and O. M. Mosier of American, and Juan Trippe, Henry Friendly, and Wilbur Morrison, of Pan Am, as being among those who "seemed to enjoy" his fruitless efforts to implement the 1946 CAB award.

"Smith," Rickenbacker said, "was quite outspoken—something to the effect that we were wasting our time trying to get into Mexico City. Mosier just laughed at us. We were being opposed by what we might think were our best friends."

People

Manufacturing

George A. Page, Jr. elected v.p. in charge of research and engineering for the Aeronca Manufacturing Corp., from director of engineering.

Dr. Theodore Theodorsen, scientist with the Air Research and Development Command for the past three years, joined the Fairchild Engine Div. of Fairchild Engine and Airplane Corp. as a consultant.

H. Webster Crum, formerly gen. sales mgr., elected v.p. of Avco Manufacturing Corp. for coordination of defense and industrial sales.

Page

Macklin

Edward J. Scott, former ass't sales mgr., named operational mgr. of the new Greer Hydraulics of Canada, subsidiary of Greer Hydraulics, Inc.

Joel R. Baker has moved from chief test pilot for Chance Vought Aircraft to chief engineering test pilot for North American Aviation, Inc.

Doyle O. Hickey and **H. J. Buttner** named director and manager, respectively of Continental Motors' new products div.

James R. Keer, former chief of the legislative liaison div. of the Air Material Command, appointed director of the Avco Manufacturing Corp.'s west coast div.

John N. Eustis appointed director of All American Engineering Co.'s Georgetown (Del.) test base.

George R. Dutton named mgr. manufacturing control materials of L. B. Smith Aircraft Corp., Miami.

C. D. Manhart named gen. mgr. Bendix Products Div. Aircraft products, and **W. L. Webb,** named gen. mgr. Bendix Products Div. missiles. In Bendix Scintilla Div. **G. W. Conover** named Washington representative.

Airlines

Robert L. Turner, v.p.-sales of Northeast Airlines, elected president of the Air Traffic Conference, succeeding **Charles R. Speers,** senior v.p.-sales of American Airlines. **Frank J. Macklin,** assistant v.p. of the Air Transport Association, was named executive secretary of the Conference.

Thomas J. Kirkup named gen. traffic and sales mgr. for Mohawk Airlines.

J. M. Ferris has moved from Tokyo as head of Canadian Pacific Air Lines' staff there to sales mgr. for Canada.

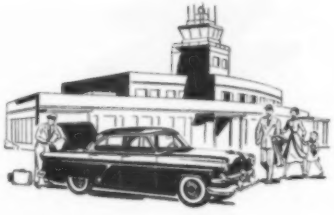
Dr. Lewis C. Sorrell resigned as director of the economic research div. of the Air Transport Association to assume the Walker-Ames Service professorship in transportation, marketing, and foreign trade at the University of Washington.

Arthur L. Hewitt promoted from interline and agency sales mgr. to director of interline and agency sales for Western Air Lines.

Shigeo Yamada named district sales mgr. to head Japan Air Lines' Chicago office.

Lan Caldwell, chief engineer for Capital Airlines, is in England to serve as liaison officer between Capital, Vickers-Armstrongs, and Rolls-Royce.

Hertz opens new office in the CHARLESTON, S. C. Municipal Airport



Hertz, already at most major airports everywhere, expands again to bring airlines NEW PASSENGER REVENUE.

Why Hertz brings more revenue to your airline

1. Hertz originated the Plane-Auto Plan. Many people who normally drove from city to city—mainly because they needed a car at their destination—now take a plane for speed and comfort . . . because they know they can rent a Hertz car on arrival.

2. Only Hertz assures your passengers of a car wherever they go . . . because Hertz serves more airports and more cities throughout the world than any other rent-a-car system.

3. Hertz spends nearly $1,000,000 a year in advertising the Plane-Auto Plan in national magazines. No other rent-a-car company even approaches this figure!

Why your passengers prefer Hertz

1. Because of extensive advertising, Hertz Rent-A-Car has wide acceptance . . . and therefore people demand it.

2. Hertz offers 30 years' experience in courteous rent-a-car service . . . with nearly 850 offices in over 550 cities throughout the world.

3. The 8,600 cars in the Hertz System are clean, new, properly conditioned for dependable driving. The reasonable rate includes all gasoline, oil . . . Public Liability, Property Damage, Fire and Theft Insurance, and $100.00 deductible collision protection—*at no extra cost!*

4. The Hertz System has issued 1,500,000 Hertz Charge Cards and Courtesy Cards to qualified individuals and firms—and these assure a huge consistent business. Hertz also honors Air Travel Cards.

ONLY Hertz offers all these advantages. Therefore, get your ticket sellers and information clerks to ask your passengers this simple question: **"May I reserve a Hertz car for you at your destination?"** It will pay off in more customer good will . . . and in extra passengers and revenue for your airline.

Promote the Hertz Plane-Auto Plan in all your advertising, displays, folders and other advertising and promotional programs.

For complete information write:

Department C12, 218 S. Wabash Ave., Chicago 4, Ill., Phone: WEbster 9-5165

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New Products and Processes

Collapsible Cargo Pallet

Prototype of a new collapsible airborne cargo pallet-container introduced by Kaiser Aluminum & Chemical Corp. weighs 65 pounds and is said to be reusable indefinitely. Designed to U. S. Air Force requirements, the new unit measures 40" in height and width, is 48" long and has a collapsed height of 9¾".

USAF specifications met by the design include a load rating of 17 pounds per cubic foot or a working load of 800 pounds. Construction is 6061-T6 Kaiser Aluminum alloy throughout with the exception of stainless steel retaining clips. As an added operational feature, the container can be assembled or dismantled in about one minute without the use of tools, according to its designer.

Circle No. 30 on Reader Service Card, page 103, for more information.

New Assembling Method

Savings in both time and cost, need for fewer blueprints, all with a net improvement in manufacturing quality have been realized at Bell Aircraft Corp. with a newly adopted method of assembling complex electronic components.

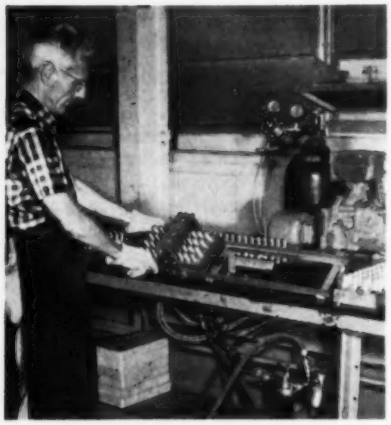
In place of the conventional procedure of working directly from blueprints or schematic diagrams, Bell now uses the Ecktacolor process of presenting the worker with a replica of the finished product in the form of a color transparency. Both the top and bottom view of the component can be displayed on a single panel, and the past practice of retaining prototype models of all units at the bench for reference has been eliminated.

Circle No. 36 on Reader Service Card, page 103, for more information.

Spark Plug Tester

Spark plug testing at United Air Lines has been speeded by development of a machine for testing four plugs at once under 200 pounds-per-square-inch pressure. The new device tests 400 plugs in 22 minutes; with older methods only 100 could be tested in that time.

A carriage holding 36 spark plugs moves along a track, bringing sets of four plugs into place beneath the firing chambers. Air-operated pistons hold the plugs in place; nitrogen and magneto



are turned on and off by use of foot treadle. Glass tops in the firing chambers permit inspection of the spark plug operation.

United, which tests 250,000 plugs annually, expects to save over 700 manhours per year by use of the machine, which was developed and largely built at the UAL San Francisco maintenance base.

Circle No. 22 on Reader Service Card, page 103, for more information.

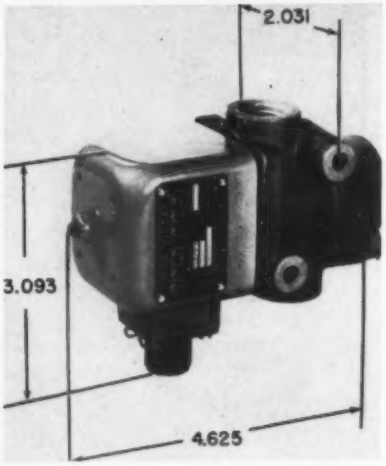
Coil Winder

A midget toroidal coil winder developed by Electro Devices Co. operates at speeds up to 600 turns per minute and winds 30- to 40-gage wire into coils as small as ⅛" finished inside diameter. The machine can be bench- or pedestal-mounted. It measures 8" x 14" and is 15" high.

Circle No. 33 on Reader Service Card, page 103, for more information.

Pneumatic Valve

New series of solenoid-operated pneumatic selector and shut-off valves for aircraft and guided missile installations covers a pressure range from 0 to 3000 psi and temperature span from -65° F to 265° F. Current draw is less than 1 ampere at 24 volts d-c continuous duty. Mar Vista Engineering Co.



Circle No. 2 on Reader Service Card, page 103, for more information.

Gage Cutout

Greer, Inc. is marketing a new gage cutout to protect instruments from damage from excessive line pressures. A low-pressure model is especially designed for ranges from 10-300 psi and a high-pressure cutout is available for pressure ranges from 100 to 3000 psi.

Circle No. 35 on Reader Service Card, page 103, for more information.

Tube Holders

New vertical subminiature tube holders for printed circuit applications in guided missile systems are rated for

5 g shock loads at 500 cycles. Available diameters are 0.375" and 0.5". Literature available. Atlas E-E Corp.

Circle No. 7 on Reader Service Card, page 103, for more information.

UNDER ONE ROOF

By James J. Haggerty, Jr.

(No. 6 in a series)

"4 miles of truck highway inside one building speeds Lockheed work in Georgia's GAP-6"

Says James J. Haggerty, Jr., Aviation Staff Writer, Collier's

One step inside the B-1 Building at Government Aircraft Plant No. 6 (GAP-6) and the enormity of its manufacturing area awes you. Here, truly, is the space needed for efficient production of multi-jet aircraft.

Building B-1 is nearly a half-mile long and almost a quarter-mile wide. Its final assembly bay has a 300-foot clear span 45 feet high for the entire 2045-foot length of the building.

This big manufacturing building—largest integrated aircraft plant *under one roof* in the world—has four miles of two-lane truck highway inside the building, providing quick and easy access for material handling to and from all production areas.

GAP-6 is in Marietta, Ga. Since 1951 it has been operated by Lockheed for the U. S. Air Force. The bigness of GAP-6 makes it possible to simultaneously build 92½-ton B-47 jet bombers and C-130A turbo-prop combat cargo airplanes and still have room to build even other big aircraft for our modern Air Force.

Use of these "inside truck highways" to speed the flow and reduce the handling of material is another example of "spaciousness" paying off in efficient, economical operation to effect high quality, on-schedule delivery of big airplanes.

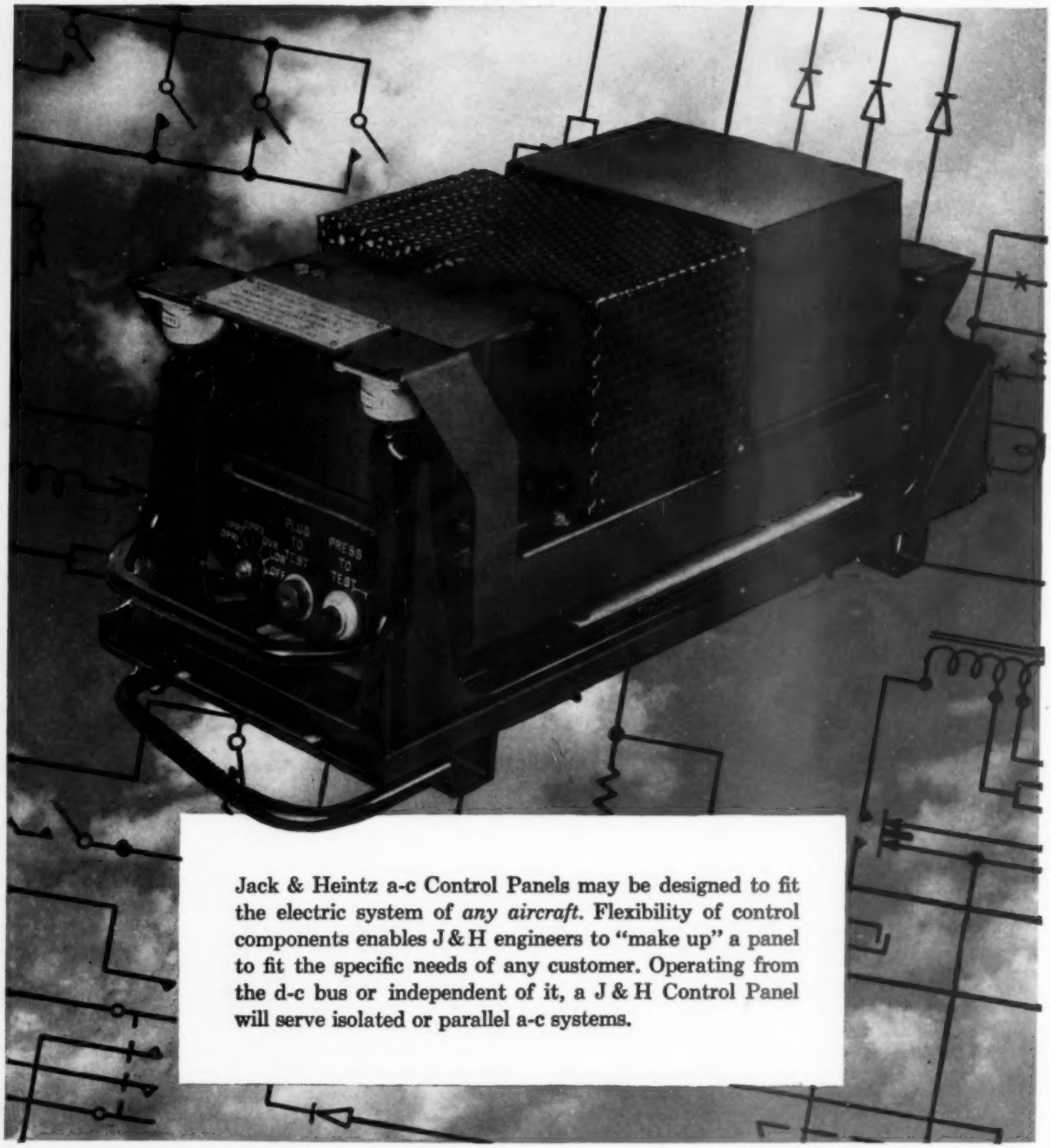
U.S. Air Force
Govt. Aircraft Plant No. 6

Lockheed
Aircraft Corporation

Georgia
Division, Marietta

(a Lockheed advertisement)

A-C CONTROL PANELS...

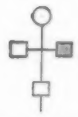


Jack & Heintz a-c Control Panels may be designed to fit the electric system of *any aircraft*. Flexibility of control components enables J & H engineers to "make up" a panel to fit the specific needs of any customer. Operating from the d-c bus or independent of it, a J & H Control Panel will serve isolated or parallel a-c systems.

JACK & HEINTZ *Rotomotive*

a report from JACK & HEINTZ

J&H Tailors Panels to Specific Customer Needs



Designed to meet applicable USAF and USN specifications, J&H Control Panels can include any of the features listed below. Typical of many unique J&H control elements is the new overvoltage relay. This unit is designed to be insensitive to acceleration forces. All panel functions can be supplied as individual components.

Other a-c equipment: J & H has developed other major components of the a-c system, including: air-cooled, liquid-cooled and vapor-cooled generators; static-magnetic-amplifier type regulators; and balanced, rotary latch circuit breakers. Auxiliary components include: transformers, reverse power relays, phase sequence relays and others.

JACK & HEINTZ A-C CONTROL PANELS

J&H PART NUMBER	GC88-1	GC100	GC102	GC105	GC112	GC127-1	GC127-2	✓
Specification	WCLEE1-28	WCLEE1-22	WCLEE1-35	WCLEE1-37	WCLEE1-27	J&H	J&H	☐
Single or Three Phase	Three	Three	Three	Three	Three	Three	Three	☐
Voltage	115/200	115/200	115/200	115/200	115/200	115/200	115/200	☐
Frequency (cps)	380/420	320/1200	380/420	380/420	380/420	380/420	380/420	☐
Isolated or Paralleled System	Both	Isolated	Isolated	Isolated	Both	Isolated	Isolated	☐
Differential Current Fault Protection	Yes	Yes	Yes	Yes	Yes			☐
Underspeed Protection	Yes						Yes	☐
Phase Sequence Protection	Yes						Yes	☐
Open Phase Protection								☐
Generator Control Relay	Yes	Yes	Yes	Yes	Yes	Yes	Yes	☐
GCR Anti-Cycle	Yes	Yes	Yes	Yes	Yes	Yes	Yes	☐
Overvoltage Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	☐
Overvoltage Lockout		Yes		Yes	Yes			☐
Undervoltage Relay	Yes			Yes		Yes	Yes	☐
Over or Under Excitation Protection	Both				Over			☐
Field Flashing		Yes	Yes	Yes	Yes	Yes	Yes	☐
Power Indication Relay Function		Yes	Yes	Yes	Yes	Yes	Yes	☐
Transformer—Rectifier Unit		Yes		Yes	Yes			☐
D-C Control Power Transfer		Yes		Yes	Yes	Yes	Yes	☐
Lockout Relay (Manual Reset)		Yes		Yes	Yes	Yes	Yes	☐
Electric or Manual Reset	Electric	Both	Electric	Electric	Electric	Electric	Electric	☐
Remote Trip	Yes	Yes	Yes	Yes	Yes	Yes	Yes	☐
Outline Dimension (L x W x H)	14 x 6 x 4.18	15.71 x 6 x 6	9.07x6.38x3.3	11.81x7x5.5	11.81x7x5.5	11.31x7x5.5	10.81x7x5.5	☐
Weight (Lb)	9	10.5	6	8	8	7.5	7.0	☐
Inject-Eject Mounting Tray	Yes	Yes						☐
Bolt Down Mounting			Yes	Yes	Yes	Yes	Yes	☐
Vibration Isolators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	☐
Your Own Special Function or Need								☐

✓ YOUR CONTROL PANEL—In right-hand column, check features you want in a control panel. Add your own special function or need on the bottom line. Jack & Heintz can design and produce your special control panel, components or a complete a-c system. We invite your inquiry. Write Jack & Heintz, Inc., 17633 Broadway, Cleveland 1, Ohio.

Military specification numbers as used herein are for purposes of product identification only and do not necessarily imply specification conformity.

© 1954, Jack & Heintz, Inc.

AIRCRAFT EQUIPMENT

Circle No. 92 on Reader Service Card.

Servo Motor

An integrally molded stator and housing is featured in a new two-phase instrument servo motor marketed by Diehl Manufacturing Co.

Offered in one- and five-watt ratings, the new motors conform to JAN specifications for resistance to humidity, salt spray, fungus, shock, and vibration.

Circle No. 11 on Reader Service Card, page 103, for more information.

Optical Straightedge

Deviations as small as .000025" on flat surfaces up to 20" long can be measurerd with a new optical straightedge produced by F. T. Griswold Mfg. Co. Surface conditions observed through a precision feeler microscope with built-in illumination are indicated by the relative position of two indices inscribed on the reticle of the microscope.

Circle No. 16 on Reader Service Card, page 103, for more information.

Temperature Monitor

Instantaneous warning of circuit temperature changes beyond preset limits is featured in CTI system introduced by Arnoux Corp. for laboratory or airborne use. Magnetic amplifier circuitry is used throughout design for improved reliability.

Circle No. 4 on Reader Service Card, page 103, for more information.

Multi-Crystal Generator

General Electric Co. has developed a new high-powered ultrasonic generator which will make possible the design of industrial cleaning tanks accommodating larger parts as well as mass production cleaning of small parts. The new generator consists of a power oscillator housed in a separate cabinet and a herimetically sealed transducer assembly which can be placed directly into a tank of solvent.

Circle No. 9 on Reader Service Card, page 103, for more information.

Power Supply

New regulated power supply for laboratory or production testing of electronics equipment is said to provide voltage regulation within 1/2% with noise levels of less than 20 mv. Continuously variable output voltages from 0 to 400 with currents up to 200 ma are available. Shasta Division, Beckman Instruments, Inc.

Circle No. 1 on Reader Service Card, page 103, for more information.

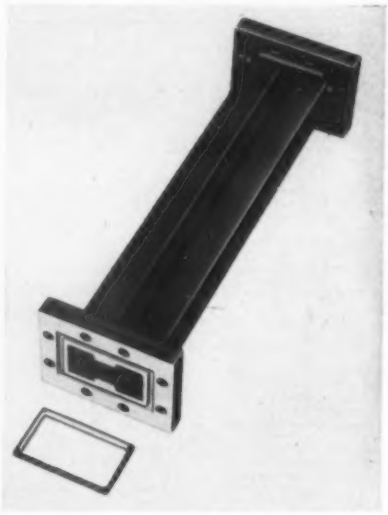
Potentiometer

New differential pressure potentiometer developed by Bourns Laboratories for guided missile applications weighs seven ounces and measures 2¼" dia. by 2⅜" long. Performance characteristics call for resolution of 0.25% to 0.50% for resistances from 1000 to 10,000 ohms.

Circle No. 8 on Reader Service Card, page 103, for more information.

Radar Waveguide

New double-ridge waveguide developed by Airtron, Inc. has an extremely broad frequency range that permits a single radio rack to radome installation for both C-band and X-band weather radar. The Airtron ARA 136 design covers a 3% band width at center frequencies of 5400 and 9300 mc and fully complies with the specifications of Aeronautical Radio, Inc. characteristic No. 529.



Circle No. 17 on Reader Service Card, page 103, for more information.

Miniature Switch

A new miniature toggle switch introduced by Electro-Snap Switch & Mfg. Co. for electronic installations is available in normally open or normally closed single- and double-throw types. Ratings are 5 amps, 125/250 volts a-c or 4 amps, 30 volts d-c resistive.

Circle No. 20 on Reader Service Card, page 103, for more information.

Transformer Amplifier

New differential transformer amplifier for use with available transducers is marketed by Daytronic Corp. The model 400 Amplifier is designed for study and measurement of oscillation conditions including force, pressure, stress, strain, and displacement.

Circle No. 6 on Reader Service Card, page 103, for more information.

THE POPULAR
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HOME OF THE FAMOUS
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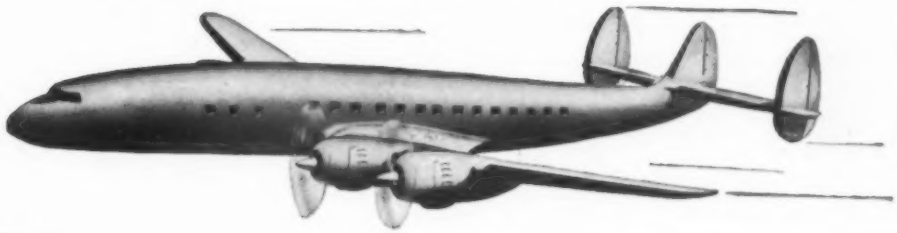
Circle No. 93 on Reader Service Card.

MORE FLIGHT HOURS



BETWEEN MAJOR OVERHAULS WITH NEW

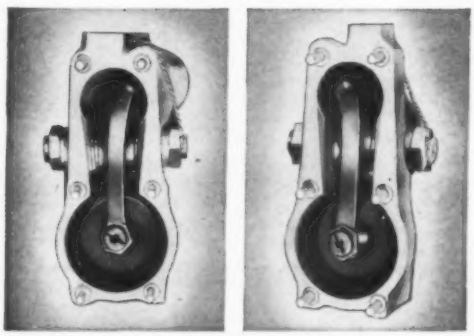
KOOLMOTOR AERO OIL

The Additive-Type Oil Approved For Commercial Airline Use

New Koolmotor Aero Oil—the additive-type aviation oil approved for commercial use—is a compound of Cities Service quality-refined base oils plus a non-ash-forming additive that reduces coke formation, valve guide wear, varnish formation and over-all engine wear. The light and heavy ends of the crude oil have been removed by the exclusive "Heart-cut" process, leaving an oil with a low carbon residue, fluid at low temperatures, and with good heat resistance, thus cutting down oil consumption. That means more flying hours between major overhauls and less manhours spent when overhauls are necessary. Koolmotor Aero Oil—ideal for private as well as commercial aircraft.

HIGH HEAT RESISTANCE **LOW CARBON RESIDUE** **LESS ENGINE WEAR** **LESS OIL CONSUMPTION**

For safer performance, less engine wear, fewer repairs, and lower oil consumption, ask your local airport to supply this new and superior grade of Cities Service Aviation Oil.



TYPICAL ROCKER BOXES after 1100 Hours and 1500 Take-Offs using Koolmotor Aero Oil. Koolmotor has been proved to keep engines cleaner in controlled flight tests at all altitudes under all weather conditions.

CITIES SERVICE AVIATION PRODUCTS

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Circle No. 94 on Reader Service Card.

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American, Pan-American, TWA, and Western ticket offices.
★ AIRPORTRANSIT
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★ AIRCRAFT MFG. CENTER

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Circle No. 95 on Reader Service Card.

Priority Valve

To improve efficiency of moisture separators in pneumatic systems, new priority valve developed by The Cornelius Co. is installed downstream from the separator. It acts to retain air in the separator until desired pressure is obtained for best moisture removal, at which time the air is permitted to pass into the system. Operating pressure is adjustable up to 3500 psi.

Circle No. 31 on Reader Service Card, page 103, for more information.

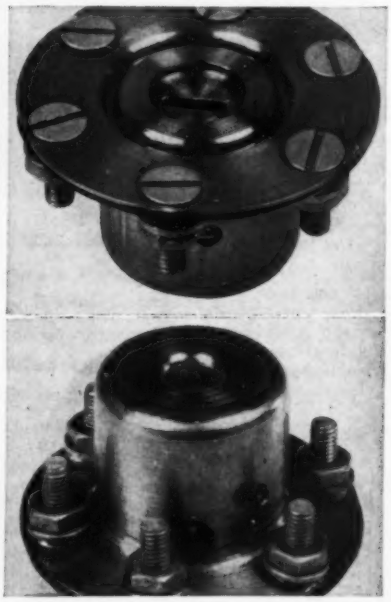
Ground Power Unit

A new line of d-c mobile ground power units for jet or piston engine starting and for ground testing electronic equipment has been developed by Bart-Messing Corp. Models are available with a range of 22-30 volts at current ratings from 50 to 2000 amperes, with an a-c input of 220/440-volt, 3-phase, 60-cycle current.

Circle No. 30 on Reader Service Card, page 103, for more information.

Water Drain Valve

The Steel Products Engineering Co. has unveiled a new water drain valve for aircraft fuel tanks which measures 2 5 16" diameter and 1 1⅛" depth. Design stresses rapid draining and positive self-closing operation. Of stainless steel construction, the valves use replaceable O-ring type sealing.



Circle No. 21 on Reader Service Card, page 103, for more information.

Copper Foil

Permacel Tape Corp. is producing a new adhesive coated copper foil called Permacel 195 for use in printed circuit work. The new foil has a heat resistance after cure to solder of 410° F temperatures for 10 seconds, and sets at a glue line temperature of 325-350° F for a period of 10-20 minutes. Pressure required for lamination varies from 100 to 2000 psi.

Circle No. 28 on Reader Service Card, page 103, for more information.

Toggle Switches

New aircraft toggle switches introduced by Arrow-Hart & Hegeman Electric Co. meet AN-3021 and Spec. MIL-S-6745 requirements. Overall dimensions are approximately 1¼" long, 5/8" wide, and 1 3/64" high, and terminal sleeve which measures 15/32" in length is said to be sand- and dust-proof.

Circle No. 13 on Reader Service Card, page 103, for more information.

Crystal Adaptor

New plug-in crystal adaptors developed by Aircraft Radio Corp. for its T-11B VHF communications transmitter now provide 10 communications channels instead of five.

Circle No. 10 on Reader Service Card, page 103, for more information.

Creep Tester

A new 12,000-lb. capacity creep-testing machine for determining stresses required to rupture test specimens as well as creep properties up to rupture, is being produced by Richle Testing Machines Div., American Machine &

Bendix jet ignition systems . . .

streamlined for maximum efficiency!

Although jet ignition is a comparatively new development in the fifty year span of powered flight, progress in this vital phase of aviation has been truly remarkable.

Unlike ignition design for reciprocating engines, which has remained relatively constant, jet ignition has gone through several major design changes within the past few years.

For example, a comparison of the TLN-10 jet ignition system, produced by the Scintilla Division of Bendix, with earlier designs shows significant improvements in every operating characteristic —and at the same time original cost, operating expense and weight are substantially reduced.

Here, indeed, in the Scintilla TLN-10 jet ignition system, is a classic example of how the present national policy of greater value for the taxpayer's dollar is being put into practice.

SCINTILLA DIVISION OF Bendix
AVIATION CORPORATION

SIDNEY, NEW YORK

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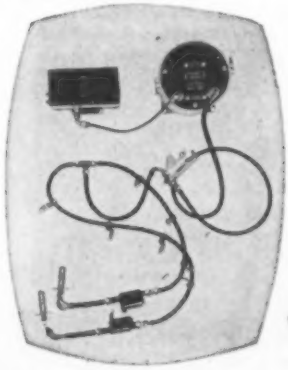
TLN-10 SYSTEM

WEIGHT 7 LBS.

- **Lower Cost—Simplified Service—Weight Reduction—Requires less current.**
- **Higher wattage available at igniter plug—Improved starting over entire range of operation—Virtual elimination of plug fouling difficulties.**
- **The TLN uses low voltage only and eliminates problems encountered with production and control of high voltage, such as dielectric losses, corona, capacitance loading, and flashover.**
- **Smaller size—Easier installation—Leads used will withstand exceptionally high temperatures—TLN-10 System is engine mounted whereas TEN-1 was both plane and engine mounted.**



EARLY DESIGN
WEIGHT 37 LBS.

Circle No. 96 on Reader Service Card.

with the

TEMPCAL

TEST OVER-HEAT DETECTORS and WING ANTI-ICE SYSTEMS ... RIGHT ON THE PLANE!

The TEMPCAL checks thermal switch and individual thermocouple ACCURACY.

TEMPCAL *functionally tests* thermal switches with their fire detection and anti-ice systems at their *operating temperatures* right on the aircraft ... and its relay circuit makes it possible to check *switches only* on or off the plane. Additionally, using a selected part of the TEMPCAL circuit, cylinder head temperature thermocouples and their circuits to the flight deck instrument can be checked.

ACCURACY—TEMPCAL Tester temperature readings are made on a highly accurate potentiometer; guaranteed accuracy is ±5°F with temperatures ranging from 0° to 800°F. Heater probes used for cylinder head thermocouples are guaranteed accurate to ±4°C at 0° to 300°C operating temperatures.

FASTER MAINTENANCE CHECKS—It is no longer necessary to take thermal switches to the "lab" for testing. TEMPCAL probes reach a temperature of 800°F in about 8 minutes for quick maintenance checks *on the aircraft.*

The production or maintenance engineer, pilot *and cost accountant* will readily realize the savings and safety factors resulting from TEMPCAL use. We invite inquiries concerning the TEMPCAL (as well as the JETCAL ..... for jet engine EGT system accuracy) *and will be glad to have our engineering department help solve your heat problems.*

b&h INSTRUMENT

B & H INSTRUMENT
Company, Inc.
1009 Norwood
FORT WORTH 7, TEXAS

Circle No. 97 on Reader Service Card.

Metals, Inc.

Feature is a ball-seated loading clevis that keeps specimen holders self-aligning and frees the test item from bending moments that otherwise produce erroneous results.

Circle No. 26 on Reader Service Card, page 103, for more information.

Test Chamber

A new portable altitude-temperature test chamber being produced by Conrad, Inc. has a temperature range of —100° F to + 300° F. Providing from

one to four cubic feet of test space the new unit can be rolled through standard door openings for on-the-spot environmental tests.

Circle No. 19 on Reader Service Card, page 103, for more information.

Power Supply

New magnetic-amplifier-regulated d-c power supply introduced by Perkin Engineering Corp. has a rated response time of 0.2 seconds and voltage regulation within ± 1%. A-c input is 230 volts ± 10%, 3-phase, 60-cycle current, and d-c output is 24-30 volts at 100 amperes.

Circle No. 32 on Reader Service Card, page 103, for more information.

Time Delay Relay

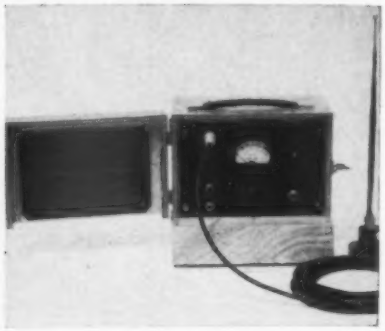
A. W. Haydon Co. has introduced new precision time delay relays which are adjustable from 2-30 seconds and weigh 1¼ lbs. The new timers are said

to be accurate within 1%, and overall dimensions of housings are 2.2" diameter by 4¼" long.

Circle No. 3 on Reader Service Card, page 103, for more information.

Radio Tester

Lear, Inc., LearCal Div., has entered production on its model 2242A transmitter test set for production line and field service of aircraft radio and electronic equipment. Designed for testing transmitters with power output up to



20 watts and operating frequency between 2 and 150 megacycles.

Four plug-in coils permit measurement of field strength from an antenna in frequency ranges of 2-20 mc and 70-150mc. Unit measures 10" high, 10½" wide, and 8" deep.

Circle No. 14 on Reader Service Card, page 103, for more information.

A-C Generator

Beckman Instruments, Inc., Arga Div. has announced production of a new A-C permanent magnet generator designed for rotating shaft position indica-

tion. Available in 1.43" and 1.67" diameters, the new Arga units are said to operate up to 6000 rmp with maximum harmonic content of 3%.

Circle No. 12 on Reader Service Card, page 103, for more information.

Voltage Regulator

A subminiature voltage regulator being produced by Rheem Manufacturing Co. Research and Development Laboratories weighs only seven ounces and measures 4.7" x 2.8" x 1.3". The Rheem REL-11 regulator has an output of 100 to 150 volts d-c at 100 milli-

Circle No. 98 on Reader Service Card. ——→

FIRST PAN AM SUPER STRATOCRUISER to use the new G-E turbosupercharger is the "Clipper Mayflower." Improved turbo allows cowl flaps above mechanic's head to be drawn in closer to the engine to reduce drag.

NEW G-E turbosupercharger kit boosts Stratocruiser's speed, range and payload

Now . . . at no increase in operating cost, Pan American's Boeing Super Stratocruiser fleet can make daily, non-stop flights from New York to Europe.

General Electric's new CH-10 modification kit contains all parts needed to install *a slightly larger turbine wheel* to replace the one now used in Boeing Stratocruiser turbos. This new wheel reduces back-pressure on R-4360 engines. It lowers engine cylinder temperatures. By reducing cooling air requirements, it permits drawing the cowl flaps closer to the engines to reduce drag, increase flight speed.

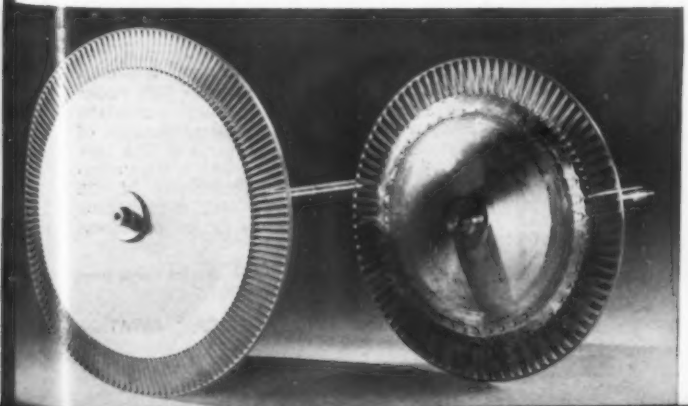
On Pan American's forthcoming Super Stratocruiser flights from New York to London and Paris, the CH-10 turbosupercharger helps make possible a 95-mile range increase; a five-knot speed increase; plus several hundred extra pounds of load capacity. Now it is possible, also, for Super Stratocruiser flights to bypass the traditional West/East refueling stop at Gander, Newfoundland—*a stop all other un-modified Stratocruisers continue to make!*

For further application data on the CH-10 modification kit, contact a G-E Aircraft Specialist via your nearest G-E Apparatus Sales Office. If you wish, write to *Section 231-2, General Electric Company, Schenectady 5, N. Y.*

Progress Is Our Most Important Product

GENERAL ELECTRIC

LARGER TURBINE WHEEL (left) is key component in General Electric modification kit. It's easy to install—only four parts must be replaced.



TRANS-ATLANTIC PAN AM FLEET will be fitted with CH-10's by Dec. 15. U.S. Air Force planes offer other possible applications.

amperes and is said to regulate within 0.1% for load variations of ± 25% and input variations of ± 20%.

Circle No. 28 on Reader Service Card, page 103, for more information.

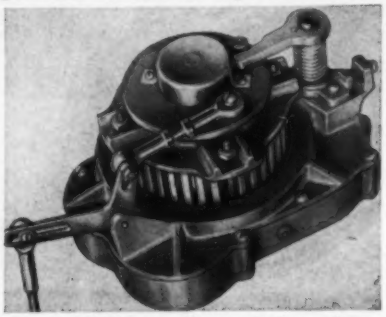
Servo Amplifier

A new electro-mechanical amplifier for servo motor applications in aircraft, guided missile, and radar applications is rated at 5 in.-lbs. torque at 60 rpm. Produced by Electomic Designs, the new Series 10 amplifier measures 2¼" in diameter by 4⅞" long, and weighs 3 lbs. 2 oz.

Circle No. 27 on Reader Service Card, page 103, for more information.

Governor

New electro-mechanical load-sensing governor to control speed of engine-driven generators has been announced by Inet Div. of Leach Corp. The Inet Dupy governor has only one moving part and is said to regulate a-c frequency within ± ½% and d-c voltage within ± 1%.



Circle No. 15 on Reader Service Card, page 103, for more information.

Plastic Impregnant

Stycast 62, a new plastic impregnant developed by Emerson & Cuming, Inc. for capacitors, filters, and RF coils is supplied as a low viscosity liquid. When cured to a solid plastic, the new material is said to have outstanding electrical properties over a useful temperature range from —55° C to +125° C.

Circle No. 29 on Reader Service Card, page 103, for more information.

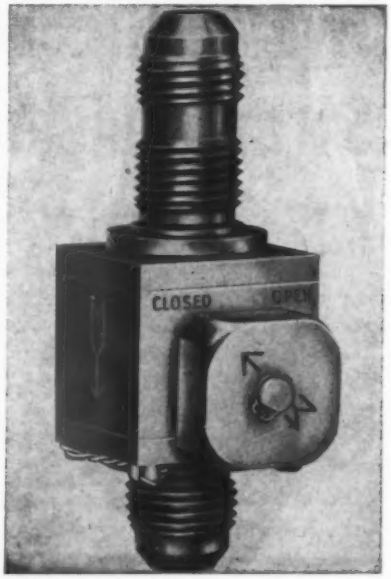
Vibration Exciter

A new large electromagnetic shaker capable of operation in environmental test chambers over a wide range of temperatures and pressures is being marketed by the MB Manufacturing Co., Inc. The MB Model C25HSP vibration exciter has a force output rating of 3500 pounds and a frequency range of 5 to 2000 cps.

Circle No. 25 on Reader Service Card, page 103, for more information.

Drain Valves

New lightweight aircraft drain valves being marketed by Clary Multiplier Corp. weigh from two to three ounces and are usable for fuel, water, oil, or air systems. Sixty combinations of inlet and outlet fittings in AN types and sizes for tube, pipe, and hose connections are available.



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Radar Tube

General Electric Co. Tube Department has unveiled a new five-inch cathode ray tube for aircraft PPI radar equipment featuring a high resolution electron gun for better identification of closely grouped ground targets. The new G-E GL-5FP14-A tube has a maximum line width limit specification of .25 millimeters compared with a specification of .50 millimeters for its predecessor GL-5FP14 tube.

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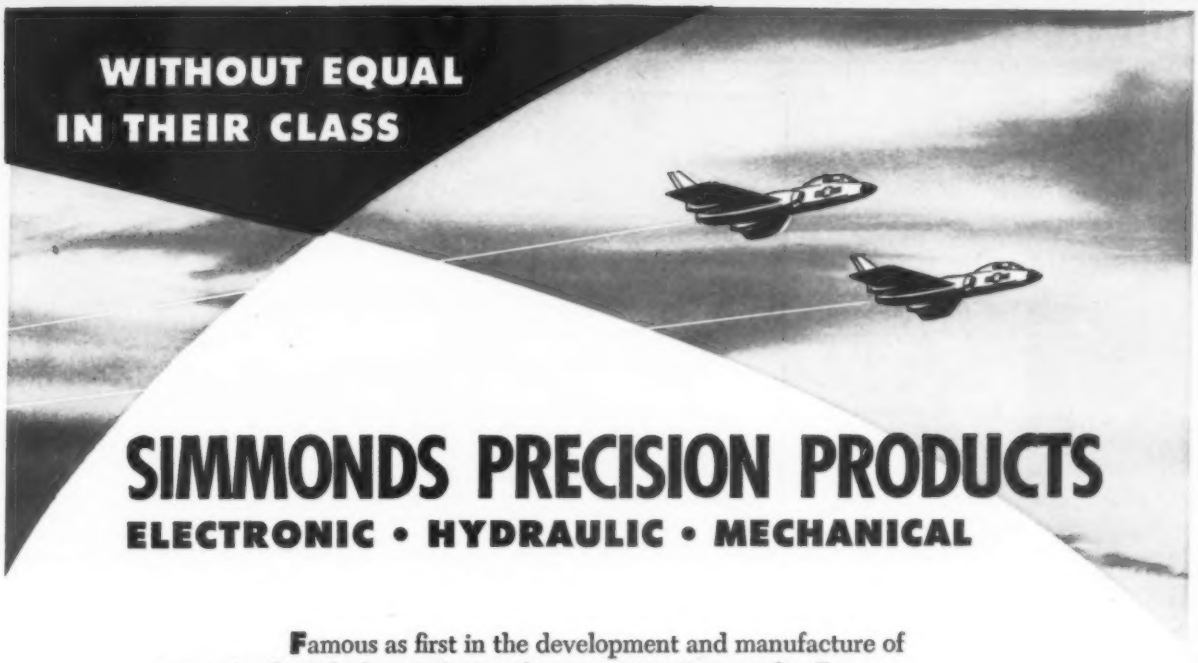

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International Aviation

By Anthony Vandyk

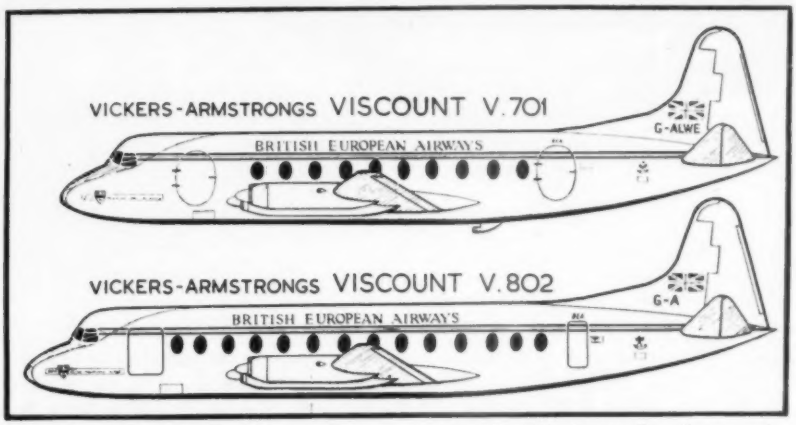
AUTHORITATIVE VOICES have recently spoken on that controversial subject—airline equipment. Giving his recipe for profits, British European Airways' chief executive Peter Masefield says: "Keep to long-stage routes on which there is adequate depth of non-seasonal traffic and little competition, and never be the first to put a new type of aircraft into service." BEA, of course, has all short- or medium-haul routes and was the first to put the Ambassador and the Viscount into operation. It has never made a profit.

Echoing Masefield's sentiments about introducing a new aircraft into service, Gordon McGregor, president of Trans-Canada Air Lines, points out that while no airline loves the prospect of being the guinea pig for a completely new aircraft type, by the same token no airline likes to be "tail-end Charlie" in adopting a successful new type.

McGregor notes that manufacturers continue to dangle carrots in front of the expectant noses of airline management: "Wonderful brochures depict aircraft of surpassing speed, range and passenger appeal, and when one's enthusiasm is aroused to the point of saying 'When can I have it?' the answer is 'Oh, 1959 or 1960.'" By bitter experience, McGregor notes, operators have learned that that means 1962 at the earliest. Therefore the operator, on the one hand, is spurred to purchasing action by urgent need and on the other is tempted to postpone buying by the prospect of better aircraft a few years hence.

Since for many years to come there will always be something better for those who wait for it, the airline which falls into the trap of waiting for the next development will end up with a fleet of obsolete equipment and a red financial statement.

Since anywhere between two and three years normally elapses between placing a major aircraft order and receiving delivery, and since, even when driven by the devil of income tax, few airlines can afford to depreciate equipment over a shorter period than seven years, the operator must today try to order an aircraft which will be completely modern two years hence, and still have traffic appeal nine years hence.



BIGGER VISCOUNT. The Viscount 800 series is only 3 ft. 10 in. longer than the present 700 series but by placing the aft pressure bulkhead back 5 ft. 5 in., internal cabin length is increased by 9 ft. 3 in. This permits 15 rows of seats accommodating 70 passengers. It will cruise at 318 mph at 20,000 ft. at a gross weight of 55,000 lbs.

Helicopters Must Fit Landing Space

The principle that the helicopter must fit the landing area, rather than vice versa, was adopted as a basis by the International Air Transport Association's helicopter working group during its first meeting in Montreal last month. A special commission has been put to work to explore the practical limits of landing spaces on the ground and on rooftops in city centers and will report to the IATA group's next meeting in Brussels late in February.

A similar commission is drafting operational requirements for air traffic control, navigation, and communications, while the technical secretariat of IATA is gathering data on what commercial operators believe should be the desirable economic characteristics of transport rotorcraft.

Transport Briefs

Australia's airline fare war has warmed up with the introduction by **Ansett Airways** of a $27 concession fare for same-day return flights between Melbourne and Sydney. Convair 340 equipment is used. This reduced fare compares with Ansett's first-class round-trip fare of $36 and the **Australian National Airways** and **Trans-Australia Airlines** $40.50 fare. It is only 28¢ more than the first-class rail with sleeper.

Trans-Australia Airlines made a profit of $257,420 in its fiscal year ended March 31, 1954 while the Australian government's other airline, **Qantas Empire Airways**, sustained an operating loss of $259,390 for the period. Last year TAA had an average passenger load factor of 70.8% while the QEA figure was 64.09%.

Both **British Overseas Airways Corp.** and **British European Airways** have started selling tickets on the installment plan to United Kingdom residents. BEA has equipped 10 of its Viscounts with rearward-facing seats in the forward part of the cabin (as in its Ambassadors) to test passenger reaction. **Hunting-Clan Air Transport** has ordered two more Viscounts, making its total order five of the turboprop transports. Another British independent, **Airwork Ltd.**, has ordered a third DC-6A, while another, **Britavia Ltd.**, has applied for permission to operate an all-freight service to Perth, Australia, via the Middle East, Colombo, and Singapore.

Manufacturing Briefs

Several new French transport designs are being offered for government sponsorship: **Hurel-Dubois** HD 70, high-aspect ratio wing, two Darts, 40 passengers, slightly more than 300 mph cruise; **Nord** 2600, a developed version of the Nord 2501 military model with two Darts plus two Turbomeca Palas at the wingtips; **Breguet** 766, four Rolls-Royce RB109, 60 tons gross, 150 passengers or a payload of 20 tons for 2175 miles or 100 passengers non-stop Paris-New York; **Breguet** 767, 4 Bristol BE25 or RR Conway, 80 tons gross, 110-130 passengers non-stop Paris-New York, 435-500 mph cruise.

Spain's **Construcciones Aeronauticas** company has started to overhaul USAF C-47's. Belgium's **SABCA** is undergoing an expansion program in connection with its Hawker Hunter off-shore procurement production schedule. Involved is an increase in capital, new facilities at Haren, and the leasing of hangars from Avions Fairey at Gosselies.

Military Briefs

France's Fouga Magister stands the best chance of being adopted as the standard **NATO** trainer, according to a high source. **Venezuela** is seeking to buy 22 F-86F's and four SA-16's for its air force. Lately the Venezuelans have tended to favor British equipment and are the only Latin Americans to date to buy Canberras. **Italy's** new chief of air staff is General Raffaeli.

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EN ROUTE . . .

WAYNE W. PARRISH

It's easy to enthuse about helicopters in Belgium

IT ISN'T OFTEN that I run into such an unusual triumvirate as I did in mid-September. I visited Sabena, a very interesting airline, in Brussels, one of the most interesting capitals of Europe, in Belgium, one of the most progressive and dynamic little countries on the globe.

Sabena has a name which baffles a lot of people and for good reason. It is made up of the first initials of the corporation title which reads: Societe Anonyme Belge D'Exploitation de la Navigation Aerienne. That's a real mouthful. The phrase "Royal Belgian Airline" is also used at times and my own personal opinion is that Sabena should identify its name more closely with the country than it does.

Belgium may be small, but Sabena isn't. It operates a sizable fleet of airplanes over almost all of Europe and deep down into Africa with particular focus on the Belgian Congo. It also, as you should certainly know, operates across the Atlantic to New York.

This is no novelty

When it comes to forward-thinking, you'll find a generous share in Sabena. Those Belgians are on the ball when it comes to visualizing the future pattern of air traffic in Europe. At least they sold me most convincingly. Sabena is currently operating the world's first international helicopter service, which I thought was sort of a routine novelty promotion since the cost is high. But it's more than a novelty—it's a prelude to big things to come.

This was my first opportunity to tour the new Sabena office building and air terminal in the heart of Brussels and I can assure you these Belgians weren't behind the barnyard fence when it came to designing a headquarters. It is modern from top to bottom. It is efficiently organized. And it's spotlessly clean. On the ground floors are restaurants and ticket offices and the departure and arriving station and one of these days you'll drive up in a cab with your bags, check in, and go down in an elevator to a railway platform and be whisked out to the airport in a very few minutes and transfer from railway platform to your airplane.

Deswarte

Even now it's easy to travel to various points in Europe by taking a short cab ride from your hotel, checking in at the downtown heliport, and leaving for Rotterdam or Cologne or Bonn or other points, via the helicopter service.

Home, Sweet Office

One interesting feature of Sabena's headquarters is the apartment set aside for the director general, William Deswarte, a tall, able lawyer who gravitated into an executive position. To get to his office he just goes up a flight of stairs. He and Mrs. Deswarte and Gilbert Perier, the board chairman, gave a delightful lunch for Bill Stackpole, AAP's v.p., and me in their apartment which is a part of the Sabena offices and yet completely isolated. It's a beauty of a place, with big wide windows looking out over a section of Brussels.

It's often said that airline executives never get away from their offices. In Deswarte's case it might be said that he never gets away from home. There aren't many people who need only five seconds to get to work or vice versa.

Perier has gone in for painting in a big way. Modern style. It is somewhat doubtful that he'll ever push Peter Paul Rubens out of the world's museums, but he's found very fine relaxation and pleasure in working with a brush. Perier is one of the pioneers of European aviation and has been a stalwart in IATA matters since the earliest days. He's one of the most respected men in international aviation.

Heaviest population concentration

But to get back to Sabena's forward outlook. One of the most stimulating persons I've ever listened to in aviation is Amselme Vernieuwe, the v.p.-operations, who is an incurable addict on the subject of helicopters. A half hour with him and you're ready to buy stock in any frustrated palm tree project that's available. Fact is, it all makes sense and logic.

Within a 200-mile radius of Brussels live 72,000,000 people, the greatest concentration of population in a similar area in the world *(New York has 23,000,000 within a 200-mile radius)*. It is obvious that fixed-wing air traffic, using conventional airports, will eventually reach a saturation point, especially in view of the excellent surface transportation available within the area.

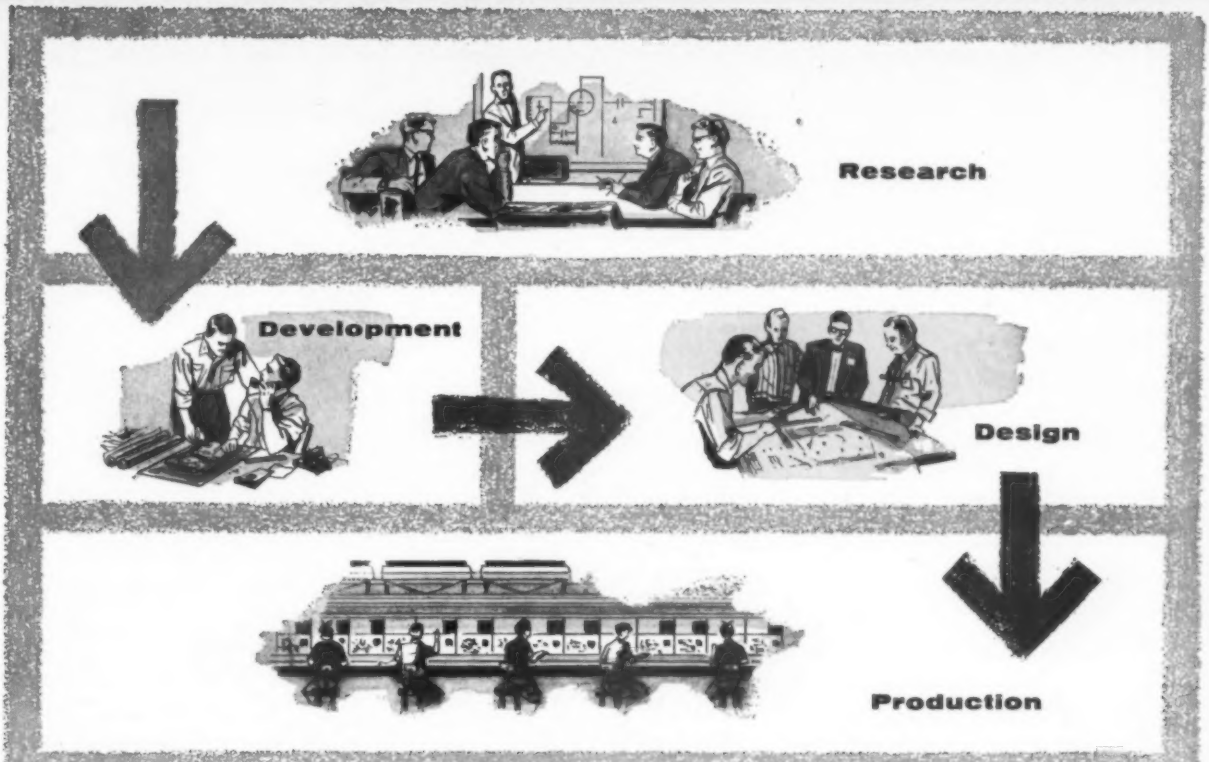
So Sabena is putting its faith and its future in the helicopter as the only ultimate means of developing short-haul air traffic within that 200-mile radius. This radius includes London and Paris and a number of German and Dutch cities. It is convinced that this short-haul traffic can only be developed through the use of in-town terminals and, of course, fixed-wing airplanes can never serve this purpose.

Perier

Big plans a-borning

Sabena admits it will be some time before a practical, economical, and large helicopter will be available, but they're convinced it's coming. *(So is Douglas Aircraft Co. which has a design for a 40-passenger job cruising at 200-250 mph using two turboprop engines.)* To prepare for this eventuality, Sabena has plans for a really big heliport on top of a large office building and terminal in downtown Brussels. It is working hard on the plans and has the financing virtually assured.

Sabena's first full year of operating the Sikorsky S-55's, figures for which have already been printed in this magazine, are quite impressive. A lot of operating bugs are being worked out now with the smaller machines. It's easy to catch the helicopter enthusiasm in Brussels and, if Sabena is right, the Belgian capital should become in time a real focal point of air service in Europe, even more so than now. I'm afraid I got captured; I think Sabena's on the right track.



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TOGGLE SWITCHES. Data Sheet P-93 gives preliminary information on a new 3-position toggle switch developed by Micro Switch, Division of Minneapolis-Honeywell Regulator Co.
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MINIATURE TIMERS. Technical data on repeat cycle timers is available in Bulletin RC-200 available from A. W. Haydon Co.
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85	86	87	88	89	90	91	92	93	94	95	96
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